FINAL
ENVIRONMENTAL IMPACT STATEMENT
AMITE RIVER AND TRIBUTARIES
LOUISIANA
EAST BATON ROUGE PARISH WATERSHED
FLOOD CONTROL

JULY 1995

LEAD AGENCY: U.S. Army Corps of Engineers, New Orleans District
COOPERATING AGENCY: Louisiana Department of Transportation and Development

ABSTRACT: A recommended solution has been developed for the flooding problems of the East Baton Rouge Parish watershed, which is a sub-basin of the Amite River Basin within southern Louisiana. The watershed consists essentially of the Baton Rouge urban area. Major floods in recent years occurred in 1973, 1977, 1979, 1983, and 1990. The 1983 flood was the flood of record and caused damages of $65,000,000. Variations of structural and non-structural alternatives were considered in early planning. Non-structural alternatives considered in specific subdivisions consisted of buy-out or relocation of structures subject to repetitive flooding, and raising structures. Late stage planning consisted of the development of channel modification plans. Economically justifiable flood control alternatives were developed for five basins within the parish. The basins are Beaver and Blackwater east and north of the Comite River; and Jones, Ward, and Fountain south of the Comite River. The Recommended Plan chosen for each basin was the one that produced the greatest economic benefits over costs. A total of approximately 66 miles of channel would be modified. This consists of approximately 25 miles of minimal clearing and snagging, 24 miles of earthen channel enlargement, and 17 miles of concrete lining of channels. Recreation features consist of construction of 11 miles of bicycle paths on the Jones basin which would also include plantings of trees. Aesthetic mitigation features consist of plantings of trees or trees and shrubs along both sides of 29.4 miles of waterways. Habitat mitigation is combined for the five basins and consists of acquisition and reforesting of a total of 397 acres of open lands. The lands would be near existing parks, as practical, within the parish and would be managed as wooded parks.

COMMENTS: Please send your comments to the U.S. Army Corps of Engineers, Policy Review Branch CECW-AR, Kingman Bldg, 7701 Telegraph Road, Alexandria, VA 22315-3861. Comments should arrive within 30 days of the publication of the Notice of Availability in the Federal Register. If you would like further information on the Environmental Impact Statement, please contact Mr. Bill Wilson, U.S. Army Engineer District, New Orleans, P.O. Box 60267, New Orleans, Louisiana 70160-0267. Commercial telephone: (504) 862-2527.

NOTE: Information, displays, maps, etc., discussed in the Feasibility Report are incorporated by reference in the Environmental Impact Statement.

1. SUMMARY

1.1. MAJOR CONCLUSIONS AND FINDINGS

1.1.1. Purpose and Alternatives. The purpose of this study is to determine the feasibility of reducing flood damages within the urban area of East Baton Rouge Parish.

1.1.2. Rationale for Recommended Plan. The alternative selected as the Recommended Plan within each basin is the plan with the greatest economic benefits over costs.

1.1.3. Environmental Losses. The most significant environmental losses would be the loss of (1) the aesthetic appeal of wooded edges adjacent to streams traversing through the otherwise brick and concrete of the city and (2) bottomland hardwood forest habitat adjacent to the streams of the project area.

1.1.4. Environmental Features. Features are incorporated in the Recommended Plan for each basin to mitigate the loss of bottomland hardwood forest habitat. Features to mitigate aesthetic losses are also incorporated into each alternative.

1.1.5. Endangered Species. A request was sent to the U.S. Fish and Wildlife Service (USFWS) for information on endangered species regarding requirements for the project as currently designed. The responding correspondence mentions the inflated heelsplitter and the bald eagle, but indicates that the USFWS anticipates no adverse effect to the inflated heelsplitter under current project design. The USFWS reports that the concern for the eagle is for an inactive nest that has not been used since the 1990 mating season. Since inactive nests are monitored for five years, they advise the District to contact their office prior to contracting any work proposed within one mile of the existing nest to determine if the nest is occupied. The Fish and Wildlife Coordination Act Report, Appendix F of this document, provides this same caution. A concern was voiced in 1990 by the Louisiana Department of Wildlife and Fisheries, Natural Heritage Program, for a unique tract of old growth woodlands in the Ward Creek basin. The design of the Recommended Plan would not include construction in that area; therefore, the identified tract would not be impacted.

1.1.6. Executive Order 11988. E.O. 11988, Floodplain Management, deals with minimizing or avoiding impacts associated with the base floodplain unless there is no practicable alternative. Project implementation would result in the removal of approximately 2,429 residencies from the 100-year floodplain. This removal would occur essentially because of the reduction of stages within the basins that would be produced by the 100-year storm. Stage reductions vary in different parts of the study area. No project benefits were projected for the conversion of wooded lands to developed lands within the 100-year floodplain. Project benefits were confined to flood losses prevented to existing residential and commercial development. They did not include any possible benefits that

would occur to future developed areas with project implementation. Project impacts to those significant resources within the 100-year floodplain are discussed primarily within the sections on bottomland hardwood forests, aquatic resources, and socioeconomic resources. Public notice of possible Federal actions to be recommended within the floodplain was made at the public meeting of October 30, 1984, the Notice of Intent in the Federal Register on February 12, 1988, and the scoping announcement of March 4, 1988.

1.1.7. Executive Order 11990. E.O. 11990, Protection of Wetlands, was considered in project planning. The decision to transport excavated material from Beaver Bayou, Blackwater Bayou, and Jones Creek watersheds to the city/parish landfill would significantly reduce adverse impacts to wetlands. Therefore, any plan included in the final array of alternatives, including the Recommended Plan, for those watersheds produces comparatively minimal effects on wetlands. Placing excavated material from Ward Creek and Bayou Fountain watersheds in Mississippi River levee borrow pits to just below the level of the surrounding batture would impact wetlands by changing an area of deep water area to a moist soil and shallow water forested wetland area.

1.1.8. Clean Water Act/Section 404(b)(1) Evaluation. A 404(b)(1) Evaluation was completed for the applicable features of the Recommended Plan for each of the watersheds. Use of any selected disposal sites would not harm any endangered species or their critical habitat. Placement of the fill material (concrete, riprap, geotextile, or excavated material) for the Recommended Plan for any watershed would not be expected to result in significant violation of applicable Louisiana Water Quality Standards. The proposed discharge would not result in unacceptable adverse effects on human health and welfare, including municipal and private water supplies and aesthetics, recreational and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife would not be adversely affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, recreational, aesthetic, and economic values would not occur. On the basis of the guidelines, the proposed discharge sites for the Recommended Plan for each basin are specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem. State Water Quality Certification, dated May 15, 1995, was granted by the Louisiana Department of Environmental Quality for the Recommended Plan for each watershed described in this report.

1.2. HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES

Hazardous, toxic, and radioactive wastes (HTRW) are of concern because of several statutes. One of the most, if not the most, significant statutes from the standpoint of construction is the Comprehensive, Environmental Response, Compensation and Liability Act (CERCLA). CERCLA addresses, among other things, the assignment of liability

regarding HTRW issues. Since liability for HTRW response is a cost that is to be born totally by the local sponsor, it is of obvious concern to any potential sponsor. The HTRW issue is discussed, not in the body of this statement but in Appendix D. The significance of those materials, of course, is not from a positive, but from a negative value standpoint. Appendix D contains records of occurrences within a large portion of East Baton Rouge Parish of regulated and unregulated materials from several databases of different regulatory agencies. Additionally, the appendix also presents observation records of a visual site survey where construction is proposed on the different watercourses. The data collection and surveys are to aid in establishing the requirements to implement the study objectives in such a way as not to impact upon hazardous, toxic, and radioactive wastes. If such wastes are found through future surveys of this nature, it is the intent to mitigate by avoidance or to modify construction in sites where those wastes are considered to be potential problems. Appendix D also includes a sensitivity analysis that identifies specific points of concern regarding HTRW and potential impacts to plan formulation. The sensitivity analysis includes a probability of HTRW occurrence within each watershed and the potential for affect on project design. Additional HTRW investigations will be accomplished in later preconstruction, engineering, and design studies.

1.3. AREAS OF CONTROVERSY AND UNRESOLVED ISSUES

There are no areas of controversy or unresolved isssues associated with the Recommended Plan for any basin.

1.4. ENVIRONMENTAL COMMITMENTS

A number of concerns have been raised during project planning that have resulted in features being developed and included in the Recommended Plan. These concerns, with the resulting commitments, are presented in Table 1.

TABLE 1

ENVIRONMENTAL COMMITMENTS FOR THE RECOMMENDED PLAN EAST BATON ROUGE PARISH PROJECT, LOUISIANA [1]

APPLICABLE RESOURCE	CONCERN	COMMITMENT	LOCATION IN EIS (Para. #)
Forestlands	Wildlife habitat	For mitigation the sum of the losses of all watersheds, approximately 397 acres of open land will be reforested with several species of oaks (Nuttall, cherrybark, willow, and water), and pecan for mast production. Planting rate will be 300 seedlings per acre. Minimal numbers of boxelder and cottonwood will be planted for rapid growth and to provide individuals for injection for cavities for cavity nesting species. Reforestation will be done on lands adjacent to local parks as possible for efficiency of management. Areas will be provided stewardship to assure the development of the habitat described. Approximately 115 acres, or more if practical, would be planted adjacent to BREC park facilities and the remainder would be planted on an area near Joor Road.	4.3.1.4.2 and Tables 4-6-1 through 4-6-5
Esthetics	Visual screen	Trees and shrubs would be planted along the respective waterways for the following miles: Jones - 4.25; Ward - 1.5; Fountain - 2.5; Beaver - 7.6; and Blackwater - 13.5.	4.3.1.3.1
Cultural Resources	Cultural Resources	Cultural resources studies will be completed in accordance with the National Historic Preservation Act of 1966, as amended, and in accordance with the schedule.	5.2.1.5., 5.2.2.5 ... 5.2.5.5.
Recreation Resources	Develop-ment Plan	Bike path of approximately 11 miles would be constructed adjacent to Jones Creek. Construction of path would include the planting of hardwood trees approximately 25 feet apart on each stream bank.	4.2.1.3.
Noise	Construct-ion noise	Construction will be accomplished only during daylight hours.	5.2.1.8. 5.2.2.8. 5.2.3.8. 5.2.4.8. 5.2.5.8.

[1] Commitment to be met by inclusion in the plans and specifications with subsequent transmittal to the field.

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3. NEED FOR AND OBJECTIVES OF STUDY

3.1. STUDY AUTHORITY

The study is part of the Amite River and Tributaries Study authorized by a resolution adopted April 14, 1967, by the Committee on Public Works of the United States Senate at the request of former Senator Russell B. Long and the late Senator Allen J. Ellender. Due to the complex nature of the flood problems, the feasibility phase studies were divided along hydrological and political boundaries to advance the study process. Seven watersheds were identified as having the potential for Federal participation in flood control studies. This study focuses on the East Baton Rouge Parish basin and is an interim response to the authorizing resolution.

3.2. PUBLIC CONCERNS

The public is concerned about flooding within the urban portion of East Baton Rouge Parish. This flooding originates from excessive rainfall resulting in headwater and backwater overflow of the tributary streams of the Amite and Comite Rivers. From 1973 to 1993, major floods occurred in the Amite basin. The maximum flood of record occurred in 1983 and caused an estimated $65,200,000 in damages in East Baton Rouge Parish. The loss of bottomland hardwood habitat and urban green spaces is also of concern.

3.3. PLANNING OBJECTIVES

The following planning objectives were developed by the interdisciplinary study team and guided the study process:

- Reduce flood damages associated with headwater and backwater flooding of tributary streams in East Baton Rouge Parish.

- Minimize streambank erosion in areas where channel modifications are required.

- Minimize significant adverse environmental impacts associated with the implementation of flood control measures.

- Minimize, to the greatest extent possible, the destruction of archeological and historical resources.

- Minimize particularly the loss of bottomland hardwood forests, or if not possible, mitigate those losses "in-kind" to the extent possible.

- Accomplish all mitigation activities within East Baton Rouge Parish.

- Incorporate, to the greatest extent justifiable, recreation measures in flood control plans.

- Incorporate, to the greatest extent possible, aesthetic mitigation measures in project design.

4. ALTERNATIVES

4.1. GENERAL. Seven watersheds within East Baton Rouge Parish were studied. These include Beaver and Blackwater bayous north and east of the Comite River; Jones Creek, Clay Cut Bayou, Ward Creek, Bayou Fountain, and Bayou Manchac south of the Comite River and within the central and southern portion of the urban area. Numerous structural and non-structural alternatives were evaluated for each watershed. Economically justifiable alternatives were developed for Beaver and Blackwater Bayous, Jones Creek, Ward Creek, and Bayou Fountain. No economically justifiable plans were identified for Clay Cut Bayou or Bayou Manchac.

4.2. PLANS ELIMINATED FROM FURTHER STUDY

2.1. Jones Creek basin

2.1.1. Plan JCCL-P2. Concrete lined 25-Yr main stem plus tributaries. This alternative was not economically justified.

4.2.1.3. Plan JCCL-P4. Concrete lined 25-Yr main stem only. Not economically justified.

4.2.2. Ward Creek basin

4.2.2.1. Plan WCC-P1. Concrete lined 25-Yr main stem only. Not economically justified.

2.2.2. Plan WCC-P2. Concrete lined 50-Yr main stem only. Not economically justified.

4.2.2.3. Plan WCC-P3. Concrete lined 100-Yr main stem only. Not economically justified.

4.2.2.4. Plan WCC-P4. Concrete lined 25-Yr main stem plus Dawson Creek and North Branch Ward Creek. Not economically justified.

4.2.2.5. Plan WCC-P4A6. Concrete lined. Not economically justified.

4.2.2.6. Plan WCC-P5. Concrete lined 25-Yr main stem plus tributaries. Not economically justified.

4.2.2.7. Plan WCC-P6. Concrete lined 50-Yr main stem plus tributaries. Not economically justified.

4.2.3. Bayou Fountain basin

4.2.3.1. Plan BF-25A. Earthen channel 25-Yr. Not economically justified.

4.2.3.2. Plan BF-25B. Earthen channel 25-Yr. Not economically justified.

4.2.3.3. Plan BF-25C. Concrete-lined channel 25-Yr. Not economically justified.

4.2.3.4. Plan BF-50. Earthen channel 50-Yr. Not economically justified.

4.2.3.5. Plan BF-50C. Concrete-lined channel 50-Yr. Not economically justified.

4.2.3.6. Plans BFPS 300, 600, and 900. Pump station with 300, 600, and 900 cubic feet per second (cfs) capacity and each including associated barrier levee. Not economically justified.

4.2.3.7. Plans UBF350A and B. Pump station located on Upper Bayou Fountain with and without flow diversion to the Mississippi River. Not economically justified.

4.2.3.8. MEADRL and HHLPRC. Ring levees around Meadow Bend and Highland Park Subdivisions. Not economically justified.

4.2.3.9. BUYOUT 10 and 25. Buyout of properties in the 10 and 25 year floodplains. Not economically justified.

4.2.3.10. Various combinations. Not economically justified.

4.2.4. Beaver Bayou basin

4.2.4. Plan Preliminary BEN-P1. Channel enlargement of 7.8 miles on Beaver Bayou and 3.7 miles on two tributaries (10-year design). Discharge of tributaries does not meet requirements for Federal participation.

4.2.5. Plan Preliminary BEN-P2. Channel enlargement of 7.8 miles on Beaver Bayou and 3.7 miles on two tributaries (25-year design). Discharge of tributaries does not meet requirements for Federal participation.

4.2.6. Plan Preliminary BEN-P3. Channel enlargement of 7.8 miles on Beaver Bayou and 3.7 miles on two tributaries (50-year design). Discharge of tributaries does not meet requirements for Federal participation.

4.2.4. Plan BBC-P7. Minimal concrete lined main stem plus tributaries. Comparatively weak economic justification.

4.2.4. Plan BBC-P8. Minimal concrete lined main stem only. Comparatively weak economic justification.

4.2.5. Blackwater Bayou basin

4.2.5.1. Plan BW-P1. Earthen channel 10-Yr main stem only. Not economically justified.

4.2.5.2. Plan BW-P3. Earthen channel 25-Yr main stem only. Not economically justified.

4.2.5.3. Plan BW-P5. Concrete lined 10-Yr main stem only. Not economically justified.

4.2.5.4. Plan BW-P6. Concrete lined 10-Yr main stem plus tributaries. Not economically justified.

4.2.5.5. Plan Prelininary BW-P2. Channel enlargement of 8.8 miles on Blackwater Bayou and 6.7 miles on two tributaries (10-year design). Discharge on one of the tributaries does not meet requirements for Federal participation.

4.2.5.6. Plan Preliminary BW-P4. Channel enlargement of 8.8 miles on Blackwater Bayou and 6.7 miles on two tributaries (25-year design). Discharge on one of the tributaries does not meet requirements for Federal participation.

4.2.6. Clay Cut Bayou basin

4.2.6.1. Plan A. 25 Year concrete-lined channel. Not economically justified.

4.2.6.2. Plan B. Backwater control structure and barrier levee. Not economically justified.

4.2.6.3. Plan C. Earthen channel. Not economically justified.

4.2.7. Bayou Manchac basin. Pump station and barrier levee. Not economically justified.

4.2.8. Non-Structural Alternatives

Non-structural alternatives considered consisted of floodplain management, floodproofing of structures, raising structures in place, building small earthen levees of floodwalls, construction of small-scale ring levees around smaller areas or subdivisions, buy-out or

relocation of structures subject to repetitive flooding, and public acquisition of floodplain land. Although non-structural alternatives address the planning objectives reflecting concern for the environment, they did not cost-effectively address the flood damage reduction objective sufficiently to retain them for late-stage planning. After review of the draft report, more extensive evaluation was made of non-structural alternatives in the Beaver and Blackwater watershed late in the planning process. Costs of flood-proofing by house elevation and ring levees were then determined to be comparable to channel modification alternatives. The net economic benefits of the channel modification alternatives were determined to be significantly higher than those of the non-structural alternatives. Thus, the channel modification alternatives were determined to be more cost-effective. Subsequently, the non-structural alternatives were not added to the plans considered in detail.

4.3. PLANS CONSIDERED IN DETAIL

General. Table 4-1 displays a concise summary with pertinent information of the plans considered in detail within the different watersheds.

4.3.1. Jones Creek basin

4.3.1.1. Plan JCCL-P1. The proposed plan for Jones Creek consists of widening approximately 18 miles of channel designed to convey in excess of a 25-year storm event within stream banks. Improvements on the main stem of Jones Creek are proposed from its mouth upstream to Lobdell Road. Also included are proposed improvements to the creek's two main tributaries as well as one sub-tributary. Proposed improvements to Weiner Creek begin at its confluence with Jones Creek and proceed upstream to Cedar Crest Avenue. Proposed improvements to Lively Bayou begin at its Jones Creek confluence and extend upstream to its crossing with the Illinois Central Railroad. Proposed improvements to the Lively Bayou Tributary begin at its confluence with Lively Bayou upstream and extend to Tams Drive (see Plates 16 and 44).

The proposed channel design calls for a 5-foot bottom width with 3:1 sloped banks. Both the channel bottom and banks are to be lined with concrete. This design remains constant for all of the above-listed channel reaches with the exception of the most downstream segment of Jones Creek. In this reach, from its mouth to Jones Creek Road, only channel clearing and snagging is proposed. Excavated material for this and all other alternatives within this watershed would be hauled to a city/parish landfill for disposal. Required operation and maintenance (O&M) for the channels consists of continuous inspection and debris removal, annual herbicide application on earthen channels, and pavements repairs as necessary. Clearing and snagging will be performed where necessary every 5 to 10 years maximizing the use of hand-held equipment. Herbicide application would be conducted in accordance with guidelines of the Environmental Protection Agency (see Appendix E,

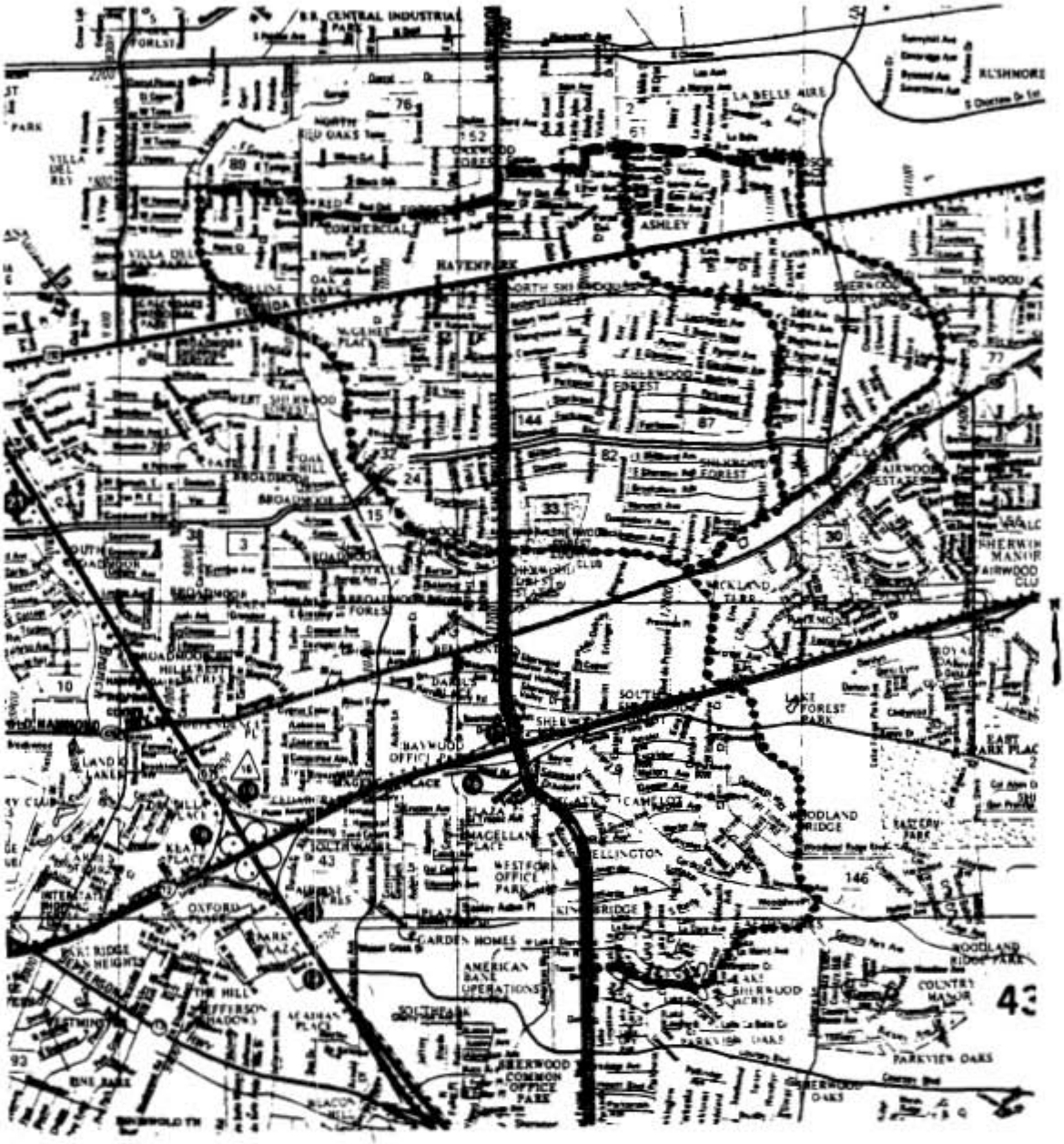
Section 7). Maintenance of the recommended combined project mitigation areas for the tentatively selected plans would include protection of the land and plantings to achieve the habitat value projected.

4.3.1.2. Plan JCCL-P3. This plan for Jones Creek consists of widening approximately 12 miles of channel designed to convey in excess of a 10-year storm event within stream banks. Improvements on the main stem of Jones Creek are proposed from its mouth upstream to Lobdell Road. No work is proposed for the tributaries. The proposed channel design calls for a five foot bottom width with 3:1 sloped banks. Both the channel bottom and banks are to be lined with concrete. This design remains constant except for the most downstream segment of Jones Creek. In this reach, from its mouth to Jones Creek Road, only channel clearing and snagging is proposed. Required O&M would be similar to Plan JCCL-P1.

4.3.1.3. Recreation Development Plan. A recreational bike path would be a feature of any alternative considered within this watershed. The western fork of the Jones Creek bicycle path begins at Cuyhanga Parkway traversing the western stream bank in a southerly direction for approsimately 5 miles. At the convergence of Weiner Creek, the path would turn west along the northern bank of Weiner Creek for approximately one mile and end at South Sherwood Forest Boulevard near Lake Sherwood Avenue North. The northern segment of the center leg of the path would begin on the western bank of Lively Bayou Tributary at Tams Avenue. This portion of the path would extend approximately two miles south and adjoin the Lively Bayou eastern leg near Woodcliff Street. The northern beginning of the Lively Bayou eastern leg would begin at the dead end of Wallis Street and extend south for approximately 2.5 miles. A steel and wooden bridge, 10 by 50 feet, would be installed on the western side of Lively Bayou facilitating the crossing of Lively Bayou Tributary at its terminus with Lively Bayou. At that point, the path would continue on the western bank of Lively Bayou. At Old Hammond Highway, the path would continue on the northern right-of-way of the highway. A steel and wooden bridge, 10 by 150 feet, would be placed along this right-of-way crossing Jones Creek connecting the Lively Bayou path to the western side of the Jones Creek path. Tree planting would be included. Figure 1 graphically illustrates the bike path route. Dots represent the project bike path and dashes delineate the proposed street connector routes that contribute to a "riding circuit". The total length of the outer perimeter is 14 miles. The plan would also include any necessary operation, maintenance, and replacements.

4.3.1.4. Mitigation. Measures to mitigate both aesthetic and habitat losses for Jones Creek basin and all other basins were developed. Planning and plans are described below.

4.3.1.4.1. Aesthetic mitigation. Aesthetic mitigation has been developed for each of the alternatives for each of the basins. The loss of top-of-bank trees and shrubs will be mitigated on site by replacement with similar vegetation. The Jones Creek plan, as well as



JONES CREEK RECREATION PLAN

●●●●●● Project bike path, 11 miles

– – – – – Street connector route (non-project)

0 1

Scale: 1.5" = 1.0 Miles

Figure 1

the plans for Ward Creek and Bayou Fountain basins, consists of replanting both hardwood trees and shrubs with a spacing of 25 and 15 feet, respectively, for a total of 402 and 704 units per mile. Plantings would be done on both sides of the channels. However, the plans for the Beaver and Blackwater basins would consist of planting hardwood trees only. The Jones, Ward, and Fountain basins are in heavily populated urban environments, whereas Beaver and Blackwater basins are in rural areas. This rural versus urban project setting determines the extent of replacement vegetative plantings. The rationale for this planting scheme is that the losses are more significant simply because of the number of visual observations lost in an urban setting when compared to a sparsely populated rural site. Since potential significant aesthetic losses are greater in urban areas, more intense and immediate mitigative planting is required in these areas. However, population density in rural areas is low; therefore, potential aesthetic losses are not as great and are less in intensity than in urbanized areas. Open farm lands and more expansive wooded tracts dominate the rural areas; therefore, only hardwood trees will be planted along these impacted stream banks. Linear miles of tree/shrub aesthetic mitigation for the individual Recommended Plans are 4.25, 1.5, 2.5, 7.6, and 13.5, for the Jones, Ward, Fountain, Beaver, and Blackwater basins, respectively. Appendix E, Section 2 explains the details of the aesthetic plan.

4.3.1.4.2. Habitat mitigation. Habitat mitigation needs for the Recommended Plan for the Jones Creek basin and all other basins were summed to produce the total need for all. The total plan, therefore, is made up of the mitigation needs of all basins and the plan for the Recommended Plan for any basin can be allocated according to the individual mitigation need. The plan consists of creating bottomland hardwood habitat on lands expected to remain, if the project were not to be implemented, in an open or unforested status. The combined mitigation plan is to acquire and reforest by planting approximately 397 acres of open land. Lands adjacent to, or nearby, as practical, land owned and operated, by the Recreation and Park Commission for the Parish of East Baton Rouge (BREC) would be a priority for acquisition and management. Since all of the mitigation needs could not be compensated cost effectively in this manner, the residual needs would be compensated by the acquisition and reforesting by planting another open area(s) located off Joor Road and near Highway 64 (or as available). Approximately 115 acres would be acquired and reforested near BREC facilities and approximately 282 residual acres would be located at the other site(s) (see Figures 52 and 53). Fencing of the area would be required. Stewardship of the area would be required to see that the planted trees are protected and to achieve the habitat value projected. The plan would also include operation and maintenance as well as any necessary replacements. Perimeter fencing would require replacements. The lands required for the individual Recommended Plans are 99, 28, 21, 122, and 127 acres, for the Jones, Ward, Fountain, Beaver, and Blackwater basins, respectively. Acreages required for mitigation for any other plans are presented in Tables 4-5-1 through 4-5-5. Mitigation is a component of each alternative within the final array.

4.3.2. Ward Creek basin

4.3.2.1. Plan JCCL-P4A5. The proposed alternative would provide approximately the 10-year level of protection and includes minimal clearing and snagging of the main stem of Ward Creek from its mouth to its termination just above Corporate Boulevard not including the newly enlarged and relocated section between Pecue and Siegen Lanes (see Plate 45). Also included is minimal clearing and snagging of Dawson Creek from its mouth to its confluence with Bayou Duplantier just above Kenilworth Blvd. Also included is concrete lining of North Branch of Ward Creek between, and including, Interstate Highway 10 (I-10) to Interstate Highway (I-12) with a design channel section consisting of a 32-foot bottom width and 1V on 3H side slopes. Finally, an existing paved section in this reach of approximately 1,250 feet shall remain. No work on this tributary above I-12 is proposed. Although the work consists entirely of concrete lining or clearing and snagging, there may be some excavated material. Any excavated earthen material, trees, and stumps would be hauled to nearby borrow sites on the batture of the Mississippi River that have been created by obtaining materials for levee upgradings in recent years. Any other refuse would be hauled to the city/parish landfill. Required O&M for the channels consists of continuous inspection and debris removal, annual herbicide application, and pavements repairs as necessary. Clearing and snagging will be performed where necessary every 5 to 10 years maximizing the use of hand-held equipment. Herbicide application would be conducted in accordance with guidelines of the Environmental Protection Agency. Maintenance of the recommended combined project mitigation areas for the tentatively selected plans would include protection of the land and plantings to achieve the habitat value projected.

4.3.3. Bayou Fountain basin

4.3.3.1. Plan BF-10A. This plan for Bayou Fountain consists of clearing and or widening approximately 11 miles of channel designed to convey a 10-year storm event within stream banks. Improvements are proposed from the bayou's mouth upstream to Stoney Creek Avenue. The proposed channel design calls for clearing and snagging only for the entire reach with the exception of a section between Seigen and Gardere Lanes. In this reach, channel widening is proposed and consists of a 50-foot bottom width with 3:1 sloped banks. It is proposed that improvements be made to one major obstruction, a 60-inch sewer main crossing located at Mile 53.8 (approximately 1,000 feet upstream of Gardere Lane near Stoney Creek Avenue). The proposed design calls for the construction of a concrete "U-channel" with a 50-foot bottom width. Any excavated earthen material, trees, and stumps for this or any other alternative for this watershed would be hauled to nearby borrow sites on the batture of the Mississippi River that have been created by obtaining materials for levee upgradings in recent years. Any other refuse would be hauled to the city/parish landfill. Required O&M for the channels consists of continuous inspection and debris removal, annual herbicide application, and clearing and snagging where necessary

every 5 to 10 years maximizing the use of hand-held equipment. Herbicide application would be conducted in accordance with guidelines of the Environmental Protection Agency. Maintenance of the recommended combined project mitigation areas for the tentatively selected plans would include protection of the land and plantings to achieve the habitat value projected.

4.3.3.2. Plan BF-10B. The proposed plan for Bayou Fountain consists of clearing and or widening approximately 11 miles of channel designed to convey a 10-year storm event within stream banks. Improvements are proposed from the bayou's mouth upstream to Ben Hur Road (see Plate 46). The proposed channel design calls for clearing and snagging only for the entire reach with the exception of a section between Seigen and Gardere Lanes. In this reach, channel widening is proposed and consists of a 50-foot bottom width with 3:1 sloped banks. It is proposed that improvements be made to one major obstruction, a 60-inch sewer main crossing located at Mile 53.8. The proposed design calls for the construction of a concrete "U-channel" with a 50-foot bottom width. Excavated material disposal and required O&M would be similar to Plan BF-10A.

4.3.4. Beaver Bayou basin

4.3.4.1. Plan BBN-P1. This plan for Beaver Bayou consists of widening approximately 7.8 miles of channel designed to convey a 10-year storm event within stream banks. Modifications are proposed from Frenchtown Road, where recent improvements are in place from this point to the mouth of the bayou, upstream to Hubbs Road. The proposed channel design is earthen with 3.5:1 bank slopes. In order to control erosion, more erodable sections of banks are proposed to be protected with a geosynthetic mat. R-90 stone would hold the mat in place. Design bottom widths vary for each reach. Required O&M for the channel consists of continuous inspection and debris removal, annual herbicide application, and clearing and snagging. Clearing and snagging would be performed where necessary every 5 to 10 years maximizing the use of hand-held equipment. Herbicide application would be conducted in accordance with guidelines of the Environmental Protection Agency (see Appendix E, Section 7). Maintenance of the recommended combined project mitigation areas for the tentatively selected plans would include protection of the land and plantings to achieve the habitat value projected.

4.3.4.2. Plan BBN-P2. The proposed plan for Beaver Bayou consists of widening approximately 7.8 miles of channel designed to convey a 25-year storm event within stream banks. As with Plan BBN-P1, modifications are proposed from Frenchtown Road, upstream to Hubbs Road (see Plate 42). The proposed channel design is earthen with 3.5:1 bank slopes. In order to control erosion, more erodable sections of banks are proposed to be protected with a geosynthetic mat. Design bottom widths vary for each reach. Required O&M would be similar to Plan BBN-P1.

4.3.4.3. Plan BBN-P3. This alternative would be the same as Plan BBN-P1, except it would be constructed to provide a 50-year level of protection.

4.3.5. Blackwater Bayou basin

4.3.5.1. Plan BW-P2. The proposed plan for Blackwater Bayou consists of widening approximately 13.4 miles of channel designed to convey a 10-year storm event within stream banks. Improvements on the main stem of Blackwater Bayou are proposed from Hooper Road upstream to Highway 64 (Greenwell Springs Road). Minor actions may be necessary on the segment from the mouth to Hooper Road. Also included are proposed improvements to the bayou's main tributary. Proposed widening of Tributary 1 begins from its confluence with Blackwater Bayou upstream to McCullough Road (see Plate 42). The proposed channel design is earthen with 3.5:1 bank slopes. In order to control erosion, more erodable sections of banks are proposed to be protected with a geosynthetic mat. Design bottom widths vary for each reach. Required O&M for the channels consists of continuous inspection and debris removal, annual herbicide application, and clearing and snagging. Clearing and snagging will be performed where necessary every 5 to 10 years maximizing the use of hand-held equipment. Herbicide application would be conducted in accordance with guidelines of the Environmental Protection Agency. Maintenance of the recommended combined project mitigation areas for the Recommended Plans would include protection of the land and plantings to achieve the habitat value projected.

4.3.5.2. Plan BW-P4. This plan for Blackwater Bayou consists of widening approximately 13.4 miles of channel designed to convey a 25-year storm event within stream banks. Improvements on the main stem of Blackwater Bayou are proposed from Hooper Road upstream to Greenwell Springs Road. Minor actions may be necessary on the segment from the mouth to Hooper Road. Also included are proposed improvements to the bayou's main tributary. Proposed widening of the tributary is from its confluence with Blackwater Bayou upstream to McCullough Road. The proposed channel design is earthen with 3.5:1 bank slopes. In order to control erosion, more erodable sections of banks are proposed to be protected with a geosynthetic mat. Design bottom widths vary for each reach. Required O&M would be similar to Plan BW-P2.

4.4. PLAN IMPLEMENTATION RESPONSIBILITY

The Federal government would prepare detailed designs, plans, and specifications and would bear 75 percent of the final costs of the plan that is recommended. Non-Federal interests would bear 25 percent of the costs and would provide all lands, easements, and rights-of-way, accomplish all relocations; hold and save the U.S. free from damages; and operate and maintain all features.

4.5. FUTURE CONDITIONS WITHOUT PROJECT / NO ACTION

With no Federal action to address the flooding problems of the study area, the flooding problems experienced in recent years would reoccur and possibly result in more extensive damages. The expansion of the city would continue with the majority of development generally occurring in a south-easterly direction. That development would occur at the expense of the minimal amount of farmed land and remaining wooded tracts in the area. Water quality would be slightly improved due to the implementation of the Louisiana Water Quality Management Plan. However, the aquatic resources of the area would continue to remain of low quality due to urban runoff being such a large portion of the flows. Continued flooding and sedimentation would further obscure potentially significant cultural resources while future development would continue to threaten these resources. Continued development will continue to diminish those characteristics that give the waterways their aesthetic appeal. Socioeconomic factors resulting from the possibility of, and after-effects of, flooding would continue to be experienced by residents and landowners in the area.

4.6. COMPARATIVE IMPACTS OF ALTERNATIVES

Tables 4-6-1 through 4-6-5 present in comparative form the significance of resources and the effects of the no action and action alternatives considered on significant resources and plan economic characteristics. Detailed information about impacts on significant resources described in these tables is included in Section 5, Affected Environment and Environmental Effects, for each watershed.

TABLE 4-1
DETAILED OR FINAL ARRAY OF ACTION ALTERNATIVES

ALTERNATIVE	SEGMENT	SIZE[1]	FROM	TO	MILES	TYPE WORK
Jones Cr.	Jones Cr	10	Mouth	Jones Cr Rd	3.4	Clr & Sng
JCCL-P1	Jones Cr	10	Jones Cr Rd	Lobdell Blvd	9.0	Concr Lined
(RP)[2]	Weiner Cr	10	Jones Cr	Cedar Crest Ave	2.0	Concr Lined
	Lively B.	10	Mouth	Ill. Central RR	3.3	Concr Lined
	Lively Trib	10	Mouth	Tams Dr	2.0	Concr Lined
	TOTAL				19.7	
Jones Cr.	Jones Cr	10	Mouth	Jones Cr Rd	3.4	Clr & Sng
JCCL-P3	Jones Cr	10	Jones Cr Rd	Lobdell Blvd	9.0	Concr Lined
	Weiner Cr					No Work
	Lively B					No Work
	Lively Trib					No Work
	TOTAL				12.4	

ALTERNATIVE	SEGMENT	SIZE[1]	FROM	TO	MILES	TYPE WORK
Ward Cr.	Ward Cr	25	Mouth	College Dr	9.2	Clr & Snag
WCC-P4A5	Dawson Cr	25	Ward Cr	B. Duplantier	3.7	Clr & Snag
(RP)	N.Branch	25	Ward Cr	Just dwnstream of I-12	1.3	Concr Lined
	TOTAL				14.2	

ALTERNATIVE	SEGMENT	SIZE[1]	FROM	TO	MILES	TYPE WORK
B. Fountain	B. Fountain	10	Mouth	Siegen Ln	4.4	Clr & Sng
BF-10A			Siegen Ln	Gardere Ln	2.9	ChanEnlarg
			Gardere Ln	Stoney Cr Ave	0.8	Clr & Sng
	TOTAL				8.1	
B. Fountain	B. Fountain	10	Mouth	Siegen Ln	4.4	Clr & Sng
BF-10B			Siegen Ln	Gardere Ln	2.9	ChanEnlarg
(RP)			Gardere Ln	Stoney Cr Ave	0.8	Clr & Sng
			Stoney Cr Ave	Ben Hur Rd	2.5	Clr & Sng
	TOTAL				10.6	

[1] SIZE = Size channel or year level of protection
[2] RP = Recommended Plan

TABLE 4-1 (CONTINUED)
DETAILED OR FINAL ARRAY OF ACTION ALTERNATIVES

ALTERNATIVE	SEGMENT	SIZE [1]	FROM	TO	MILES	TYPE WORK
Beaver B. BBN-P1	Beaver B.	10	Frnchtwn Rd	Hubbs Rd	7.8	Chan Enlar
	TOTAL				7.8	
Beaver B. BBN-P2 (RP)	Beaver B.	25	Frnchtwn Rd	Hubbs Rd	7.8	Chan Enlar
	TOTAL				7.8	
Beaver B. BBN-P3	Beaver B.	50	Frnchtwn Rd	Hubbs Rd	7.8	Chan Enlar
	TOTAL				7.8	

ALTERNATIVE	SEGMENT	SIZE [1]	FROM	TO	MILES	TYPE WORK
Blackwtr BW-P2 (RP)	Blackwater	10	Mouth	Hooper Rd	0.0	Minimal Work
	Blackwater	10	Hooper Rd	La Hwy 64	8.8	Chan Enlar
	Bwtr Trib 1	10	Mouth	McCullough Rd	4.6	Chan Enlar
	TOTAL				13.4	
Blackwtr BW-P4	Blackwater	25	Mouth	Hooper Rd	0.0	Minimal Work
	Blackwater	25	Hooper Rd	La Hwy 64	8.8	Chan Enlar
	Bwtr Trib 1	25	Mouth	McCullough Rd	4.6	Chan Enlar
	TOTAL				13.4	

TABLE 4-6-1
COMPARATIVE IMPACTS OF ALTERNATIVES
JONES CREEK BASIN

RESOURCE	SIGNIFICANCE	NO ACTION	PLAN JCCL-P1 (RP)	PLAN JCCL-P3	
AGRICULTURAL LANDS	Food and fiber production, income production	Small reduction in acreage due to development.	99 acres converted by mitigation plan	66 acres converted by mitigation plan	
FORESTLANDS	Wildlife habitat, forest products, green areas, shade, temperature reduction, property buffers, noise barrier, air quality.	Projected development rate (to open or urban use) of -2.2996% per year would continue.	78 acres and 44 HUVs lost; lost HUVs compensated by gains of mitigation plan.	52 acres and 29 HUVs lost; lost HUVs compensated by mitigation plan.	
THREATENED AND ENDANGERED SPECIES	USFWS: no species in area streams; inflated heelsplitter in Amite River; bald eagle nested nearby, but away from project area	The inflated heelsplitter would continue to exist in the Amite.	Limited turbidity increase during construction and post project effects would not effect the heelsplitter.	Same as previous plan.	
AQUATIC RESOURCES	Water quality is poor due to urban runoff, habitat is generally good only for species requiring low oxygen and wading birds	Water quality improved with Parish plan to increase wastewater diversion to Miss. River; may result in increase of habitat quality; reduced low flows would result in reduced habitat quality, especially in summer	Concrete lining causes increases in system flushing and leaching from concrete, and reduction of habitat diversity. Clearing and snagging causes reduction in habitat diversity.	Same as previous plan.	
CULTURAL RESOURCES	Three recorded sites have received previous impacts. Only one has been evaluated.	Condition of recorded sites would likely remain unchanged.	Potential for impacts to known sites will be assessed;	Same as previous plan	
RECREATION RESOURCES	Population of 380,000+ produces high demand for recreation areas in the area	Increased demand would result in increase in recreational facilities	Recreation plan = 11-mile bike path. Use is projected to be 100,000 annual user days.	Similar to previous plan, but shorter bike trail and plantings because shorter flood control work.	
AESTHETICS	Pleasing vistas result in higher property values and come hither quality; results in increased tourism and higher tax base for city	Continued demand for scenic vistas, but pressure to develop all available space.	Significant adverse impacts; aesthetic mitigation plantings on both sides of 4.25 miles of channel would replace lost top-of-bank trees and shrubs.	Similar to previous plan; however, less impacts would require less mitigation	
NOISE	Low noise levels is desirable. Noise levels on channels are low except at road crossings	Noise levels would remain essentially unchanged.	Construction equipment would cause increased noise levels for as much as 72 months. This would be spread over four segments and not over the entire area for the entire period.	Same as previous plan for as much as 41 months.	
VECTORS	Common vectors include *Anopheles, Aedes, and Culex*	Populations would be kept in check with abatement program.	Same as no action.	Same as no action.	

TABLE 4-6-2
COMPARATIVE IMPACTS OF ALTERNATIVES
WARD CREEK BASIN

RESOURCE	SIGNIFICANCE	NO ACTION	PLAN WCC-4A5 (RP)		
AGRICULTURAL LANDS	Food and fiber production, income production	Small reduction in acreage due to development	28 acres converted by mitigation plan		
FORESTLANDS	Wildlife habitat, forest products, green areas, shade, temperature reduction, property buffers, noise barrier, air quality,	Projected development rate (to open or urban use) of -2.296% per year would continue.	22 acres and 12 HUVs lost to project; habitat value lost is compensated by gains of mitigation plan.		
THREATENED AND ENDANGERED SPECIES	USFWS: no species in area streams; inflated heelsplitter in Amite River; bald eagle nested nearby, but away from project area	The inflated heelsplitter would continue to exist in the Amite.	This alternative would not affect the inflated heelsplitter.		
AQUATIC RESOURCES	Water quality is poor due to urban runoff, habitat is generally good only for species requiring low oxygen and wading birds	Water quality improved with Parish plan to increase wastewater diversion to Miss. River; may result in increase of habitat quality; reduced low flows would result in reduced habitat quality, especially in summer	Concrete lining causes increases in system flushing and leaching from concrete, and reduction of habitat diversity. Clearing and snagging causes reduction in habitat diversity.		
CULTURAL RESOURCES	Low probability for encountering significant resources due to previous channel maintenance	Condition of any sites would remain unchanged.	No change is projected. (Investigations completed under Feasibility Study.)		
RECREATION RESOURCES	Population of 150,000+ produces high demand for recreation areas in the area	Increased demand would result in increase in recreational facilities	This plan would have no impact on existing or proposed recreation development.		
AESTHETICS	Pleasing vistas result in higher property values and come hither quality; results in increased tourism and higher tax base for city	Continued demand for scenic vistas, but pressure to develop all available space.	Some adverse impacts will occur. Aesthetic mitigation plantings on both sides of 1.5 miles of channel would replace lost top-of-bank trees and shrubs.		
NOISE	Low noise levels is desirable. Noise levels on channels are low except at road crossings	Noise levels would remain essentially unchanged.	Construction equipment would cause increased noise levels for as much as 18 months		
VECTORS	Common vectors include *Anopheles*, *Aedes*, and *Culex*	Populations would be kept in check with abatement program.	Same as no action.		

TABLE 4-6-3
COMPARATIVE IMPACTS OF ALTERNATIVES
BAYOU FOUNTAIN BASIN

RESOURCE	SIGNIFICANCE	NO ACTION	PLAN BF-10A	PLAN BF-10B (RP)	
AGRICULTURAL LANDS	Food and fiber production, income production	Small reduction in acreage due to development	18 acres converted by mitigation plan	21 acres converted by mitigation plan	
FORESTLANDS	Wildlife habitat, forest products, green areas, shade, temperature reduction, property buffers, noise barrier, air quality,	Projected development rate (to open or urban use) of -2.625% per year would continue.	15 acres and 8 HUVs lost to project; habitat value lost is compensated by gains of mitigation plan.	17 acres and 9 HUVs lost to project; habitat lost is compensated by mitigation plan.	
THREATENED AND ENDANGERED SPECIES	USFWS: no species in area streams; inflated heelsplitter in Amite River; bald eagle nested nearby, but away from project area	The inflated heelsplitter would continue to exist in the Amite.	This alternative would not affect the inflated heelsplitter.	Same as previous plan.	
AQUATIC RESOURCES	Water quality is poor due to urban runoff, habitat is generally good only for species requiring low oxygen and wading birds	Water quality improved with Parish plan to increase wastewater diversion to Miss. River; may result in increase of habitat quality; reduced low flows would result in reduced habitat quality, especially in summer	Channel enlargement cause increased flushing and reduction of habitat diversity. Clearing and snagging causes reduction in habitat diversity but not as much as channel enlargement.	Same as previous plan.	
CULTURAL RESOURCES	Four potentially significant sites likely to occur in project area.	Sites likely would remain undetected; bank and sheet erosion would continue to impact unrecorded sites.	Channel widening would result in greater chance of impacts; design could avoid significant sites.	Channel widening would result in greater chance of impacts; design could avoid significant sites.	
RECREATION RESOURCES	Population of 150,000+ produces high demand for recreation areas in the area	Increased demand would result in increase in recreational facilities	No impact on existing or proposed recreation development.	Similar to previous plan.	
AESTHETICS	Pleasing vistas result in higher property values and come hither quality; results in increased tourism and higher tax base for city	Continued demand for scenic vistas, but pressure to develop all available space.	Some adverse impacts will occur. Aesthetic mitigation plantings on both sides of 2.5 miles of channel would replace lost top-of-bank trees and shrubs.	Similar to previous plan, but less impacts and less mitigation.	
NOISE	Low noise levels is desirable. Noise levels on channels are low except at road crossings	Noise levels would remain essentially unchanged.	Noise levels would be increased by construction equipment for up to 12 months.	Similar to previous plan.	
VECTORS	Common vectors include *Anopheles, Aedes, and Culex*	Populations would be kept in check with abatement program.	Same as no action.	Same as previous plan.	

X

TABLE 4-6-4
COMPARATIVE IMPACTS OF ALTERNATIVES
BEAVER BAYOU BASIN

RESOURCE	SIGNIFICANCE	NO ACTION	PLAN BBN-P1	PLAN BBN-P2 (RP)	PLAN BBN-P3
AGRICULTURAL LANDS	Food and fiber production, income production	Small reduction in acreage due to development	125 acres converted by mitigation plan	122 acres converted by mitigation plan	127 acres converted by mitigation plan
FORESTLANDS	Wildlife habitat, forest products, green areas, shade, temperature reduction, property buffers, noise barrier, air quality.	Projected development rate (to open or urban use) of -0.167% per year would continue.	88 acres and 55 HUVs lost to project; habitat value lost is compensated by gains of mitigation plan.	86 acres and 54 HUVs lost to project; habitat lost is compensated by mitigation plan.	89 acres and 56 HUVs lost to project; habitat lost is compensated by mitigation plan.
THREATENED AND ENDANGERED SPECIES	USFWS: no species in area streams; inflated heelsplitter in Amite River; bald eagle nested nearby, but away from project area	The inflated heelsplitter would continue to exist in the Amite.	This alternative would not affect the inflated heelsplitter.	Same as previous plan.	Same as previous plan.
AQUATIC RESOURCES	Water quality is poor due to urban runoff, habitat is generally good only for species requiring low oxygen and wading birds	Water quality improved with Parish plan to increase wastewater diversion to Miss. River; may result in increase of habitat quality; reduced low flows would result in reduced habitat quality, especially in summer	Channel enlargement causes increased flushing and reduction of habitat diversity. Geotech fabric would add some diversity to channel slopes and reduce expected erosion.	Same as previous plan.	Same as previous plan.
CULTURAL RESOURCES	Two potentially significant sites have been impacted by previous channel work; low probability for encountering more significant sites.	Condition of two recorded sites would remain unchanged.	Recorded sites will be evaluated; work design could avoid significant sites.	Same as previous plan.	Same as previous plan.
RECREATION RESOURCES	Population of 160,000+ produces high demand for recreation areas in the area	Increased demand would result in increase in recreational facilities	This plan would have no impact on existing or proposed recreation development.	Same as previous plan.	Same as previous plan.
AESTHETICS	Pleasing vistas result in higher property values and come hither quality; results in increased tourism and higher tax base for city	Continued demand for scenic vistas, but pressure to develop all available space.	Some adverse impacts would occur. Aesthetic mitigation plantings on both sides of 7.8 miles of channel would replace lost top-of-bank trees and shrubs. Natural succession, in time, would result in vegetation at edges of ROW.	Same as previous plan.	Same as previous plan.
NOISE	Low noise levels is desirable. Noise levels on channels are low except at road crossings	Noise levels would remain essentially unchanged.	Noise levels would be increased by construction equipment for up to 24 months.	Same as previous plan.	Same as previous plan.
VECTORS	Common vectors include *Anopheles, Aedes, and Culex*	Populations would be kept in check with abatement program.	Same as no action.	Same as previous plan.	Same as previous plan.

X

TABLE 4-6-5
COMPARATIVE IMPACTS OF ALTERNATIVES
BLACKWATER BAYOU BASIN

RESOURCE	SIGNIFICANCE	NO ACTION	PLAN BW-P2 (RP)	PLAN BW-P4	
AGRICULTURAL LANDS	Food and fiber production, income production	Small reduction in acreage due to development	127 acres converted by mitigation plan	217 acres converted by mitigation plan	
FORESTLANDS	Wildlife habitat, forest products, green areas, shade, temperature reduction, property buffers, noise barrier, air quality,	Projected development rate (to open or urban use) of -0.167% per year would continue.	77 acres and 48 HUVs lost to project; habitat value lost is compensated by gains of mitigation plan.	141 acres and 89 HUVs lost to project; habitat lost is compensated by mitigation plan.	
THREATENED AND ENDANGERED SPECIES	USFWS: no species in area streams; inflated heelsplitter in Amite River; bald eagle nested nearby, but away from project area	The inflated heelsplitter would continue to exist in the Amite River.	This alternative would not affect the inflated heelsplitter.	This alternative would not affect the inflated heelsplitter.	
AQUATIC RESOURCES	Water quality is poor due to urban runoff, habitat is generally good only for species requiring low oxygen and wading birds	Water quality improved with Parish plan to increase wastewater diversion to Miss. River; may result in increase of habitat quality; reduced low flows would result in reduced habitat quality, especially in summer	Channel enlargement causes increased flushing and reduction of habitat diversity. Geotech fabric would add some diversity to channel slopes and reduce expected erosion.	Same as previous plan.	
CULTURAL RESOURCES	Medium probability for encountering sites of significance; one site thought to have been modified — one potentially significant recorded site and one anticipated site.	Condition of one recorded site would remain unchanged; other unchanged sites would remain undetected.	Effort to identify and evaluate sites would be made; work design could avoid significant sites.	Same as previous plan.	
RECREATION RESOURCES	Population of 150,000+ produces high demand for recreation areas in the area	Increased demand would result in increase in recreational facilities	This plan would have no impact on existing or proposed recreation development.	Similar to previous plan.	
AESTHETICS	Pleasing vistas result in higher property values and come hither quality; results in increased tourism and higher tax base for city	Continued demand for scenic vistas, but pressure to develop all available space.	Some adverse effects would occur. Aesthetic mitigation plantings on both sides of 13.5 miles of channel would replace lost top-of-bank trees and shrubs. Native vegetation would become established via natural succession.	Same as previous plan.	
NOISE	Low noise levels is desirable. Noise levels on channels are low except at road crossings	Noise levels would remain essentially unchanged.	Noise levels would be increased by construction equipment for up to 24 months.	Similar to previous plan.	
VECTORS	Common vectors include *Anopheles, Aedes, and Culex*	Populations would be kept in check with abatement program.	Same as no action.	Same as previous plan.	

X

TABLE 4-6-6
COMPARATIVE IMPACTS OF ALTERNATIVES
ALL BASINS

BASIN	ALTERNATIVE	ECONOMIC CHARACTERISTICS[1]			
		Annual Benefits	Annual Costs	Net Benefits	B/C Ratio
Jones	No Action	N/A	N/A	N/A	N/A
	JCCL-P1 (RP)	$6,715,000	$4,430,000	$2,285,000	1.52
	JCCL-P3	$4,877,000	$3,294,000	$1,583,000	1.48
Ward	No Action	N/A	N/A	N/A	N/A
	WCC-P4A5 (RP)	$1,032,000	$932,000	$100,000	1.11
Fountain	No Action	N/A	N/A	N/A	N/A
	BF-10A	$416,000	$365,000	$51,000	1.14
	BF-10B (RP)	$434,000	$373,000	$51,000	1.16
Beaver	No Action	N/A	N/A	N/A	N/A
	BBN-P1	$6,081,000	$1,115,000	$4,966,000	5.45
	BBN-P2 (RP)	$7,154,000	$1,354,000	$5,800,000	5.28
	BBN-P3	$7,209,000	$1,477,000	$5,732,000	4.88
Blackwater	No Action	N/A	N/A	N/A	N/A
	BW-P2 (RP)	$3,306,000	$887,000	$2,419,000	3.7
	BW-P4	$3,465,000	$1,195,000	$2,270,000	2.9

[1] Costs shown above are not for the M-CASES cost estimates. The M-CASES estimates were prepared for the Recommended Plans only. The equivalent costs are shown in the feasibility report for each watershed under the title, (Watershed) Final Alternatives Summary of Comparative Items.

5. AFFECTED ENVIRONMENT/ENVIRONMENTAL EFFECTS

5.1. ENVIRONMENTAL CONDITIONS

The overall study area discussed in this document is the Amite River basin. The Amite River basin encompasses an area of approximately 2,000 square miles and includes portions of East Baton Rouge, Ascension, Livingston, East Feliciana, St. Helena, Iberville, St. James, and St. John the Baptist Parishes within Louisiana, and Amite County within Mississippi. The study area of this report is within this basin and consists of those portions of East Baton Rouge Parish subject to flooding of Beaver and Blackwater Bayous, Jones and Ward Creek, and Bayou Fountain. Action alternatives considered in this document would result in socioeconomic impacts and benefits to this described study area. Direct construction activities necessary for the implementation of any structural alternative would affect only a portion of the study area. That area, the area of project-induced flooding, and an area of Mississippi River levee borrow pits in the vicinity of Gardere Lane, jointly, for the remainder of this document is referred to as the affected area. Also included are portions of receiving waters immediately downstream of the mouths of each of these watercourses. This is but a small part of the overall study area. Two separate mitigation sites include an area near a facility of the Baton Rouge Recreation and Park Commission (BREC) and another site in the northern portion of the parish east of Joor Road and south of La. Hwy. 64. An alternative mitigation site that was evaluated was land adjacent to Bayou Duplantier from Stanford Avenue to near the confluence of Bayou Duplantier with Dawson Creek.

East Baton Rouge Parish is the westernmost of the Florida Parishes of Louisiana. The term, Florida Parishes, is used quite commonly when referring to this area and describes that portion of the state located east of the Mississippi River and north of Lakes Maurepas and Pontchartrain. The area is part of the original land area known as West Florida during colonial times.

The study area is of relatively low relief, with most portions being on the Pleistocene terrace land formation. Surrounding land elevations vary from highs of 120 feet National Geodetic Vertical Datum (NGVD) near the East Baton Rouge / St. Helena Parish line to approximately 5 feet NGVD near the confluence of Bayou Fountain with Bayou Manchac. Land elevations in the lower portion of the study area are approximately 30 feet NGVD at the western edge of the Pleistocene terrace before the drop-off occurs to the Mississippi River alluvial floodplain. The Mississippi River east bank levee within Louisiana begins at Baton Rouge. The study area contain a portion of the city limits of Baton Rouge. Commercial and residential development is essentially adjacent to or near major traffic arteries. The largest concentrations of undeveloped land are found in the northern portion of the study area.

5.2. SIGNIFICANT RESOURCES

A given resource is considered significant if it is identified in the laws, regulations, guidelines, or other institutional standards of national, regional, and local public agencies; if it is specifically identified as a concern by local public interests; or if it is judged by the responsible Federal agency to be of sufficient importance to be designated as significant (see Tables 5-1 and 5-2). This section discusses each significant resource occurring in the study area and listed previously in Tables 4-5-1 through 4-5-5, Comparative Impacts of Alternatives. The significance of the resource is first described. The effects of the no-action alternative and each of the action alternatives carried into the final array are also analyzed.

TABLE 5-1
ATTRIBUTES OF SIGNIFICANT RESOURCES

RESOURCE	ECOLOGICAL ATTRIBUTES	CULTURAL ATTRIBUTES	AESTHETIC ATTRIBUTES
AGRICULTURAL LANDS	Minor wildlife value	Reflects both present and past way of life for segment of population.	Vistas of farmland provide relief from clutter and technology of urban area.
FORESTLANDS	Valuable habitat for wildlife	Supports traditional extractive economy of area. Protects sites by avoiding disturbance.	Typical woodland landscape provides relief from clutter and technology of urban areas.
THREATENED AND ENDANGERED SPECIES	Rarity enhances significance of these species.	N/A	Individuals enjoy viewing of rare and endangered species.
AQUATIC RESOURCES	Water quality determines value for species. Several species of fishes and invertebrates use waters.	Fishing is a significant part of cultural heritage.	Meandering watercourses provide scenes of beauty.
CULTURAL RESOURCES	N/A	Indicators of history and inhabitants	Many cultural resources have high aesthetic value.
RECREATION RESOURCES	N/A	Association with outdoors is part of culture of area.	Park settings are perceived as aesthetic to most individuals.
ESTHETICS	None	A pleasant visual perception is a component of the culture of an area	N/A
VECTORS	Carrier of diseases to humans as well as other animals.	Generally considered to be a negative component	N/A
SOCIO-ECONOMIC RESOURCES	N/A	N/A	N/A

TABLE 5-2
RECOGNITION OF SIGNIFICANT RESOURCES

RESOURCE	INSTITUTIONAL RECOGNITION	TECHNICAL RECOGNITION	PUBLIC RECOGNITION
AGRICULTURAL LANDS	Farmland Protection Policy Act, Food Security Act of 1985	Production of food and fiber for large component of worlds population	Public recognizes value of productive agricultural land.
FORESTLANDS	Water Resources Development Act of 1986, Fish and Wildlife Coordination Act, EO 11990, EO 11988	Continued decline in Lower Mississippi Valley; value for noise abatement, increased residential real estate value, visual value, and air quality	Public recognizes value, scarcity, and continued decline of this resource in urban areas
THREATENED AND ENDANGERED SPECIES	Endangered Species Act, Bald Eagle Act	USFWS, NMFS, LDWF, & USACE cooperate to protect these species, Audubon Blue List recognizes rare species.	Public supports the preservation of rare or declining species.
AQUATIC RESOURCES	Clean Water Act of 1977, La Water Control Act, Fish and Wildlife Coordination Act, Coastal Zone Mgt Act of 1972, La State & Local Coastal Resources Mgt Act of 1978	USFWS, NMFS, LDWF, & USACE recognize value of good water quality and sustainable aquatic productivity.	Environmental groups and general public support the preservation of water quality and fishery resources.
CULTURAL RESOURCES	National Historic Preservation Act of 1966, Archeological Resource Protection of 1979	Sites are present in the vicinity of the proposed action.	Preservation groups support protection and enhancement of historical resources. There is strong avocational interest in archeology.
RECREATION RESOURCES	Land and Water Conservation Fund Act of 1965	EBR Parish has highly aggressive recreation program. 130+ facilities in parish	Public makes high demands on recreation areas and desires expansion of base; EBR Parish Horizon Land Use Plan
AESTHETICS	USACE ER 1105-2-100, National Environmental Policy Act	Greenlinks concept element of The Horizon Plan, the Comprehensive Land Use and Development Plan for East Baton Rouge Parish	Residents put value upon appealing scenes as reflected by land prices, trees on lots, and demand for parks, etc.
VECTORS	Mosquito abatement unit in local government	Several mosquitos are known carriers of disease.	Public supports active control program for offensive pests.
SOCIO-ECONOMIC RESOURCES	River and Harbor Flood Control Act	N/A	Social concerns and items affecting area economy are of significant interest to community.

5.2.1. **Jones Creek Basin**

5.2.1.1. AGRICULTURAL LANDS.

5.2.1.1.1. Significance. Approximately 158,500 acres are classified as farmland in government jurisdiction (land capable of being farmed) in East Baton Rouge Parish. A large portion of this is prime farmland. Prime, unique, and statewide or locally important farmland is protected by the Farmland Protection Policy Act (FPPA). Approximately 129,500 or eighty-one percent of the acreage noted is defined as farmland by the FPPA. Crops grown are soybean, corn, wheat, and pasture for cattle. The use of cleared land for agricultural purposes in the study area is continually declining as urbanization of Baton Rouge and the surrounding communities proceeds. Value of these lands is based only in part by their ability to produce a crop, but is most heavily based upon their potential for development into economically higher uses. Agricultural land has value for some forms of wildlife, but because of the regional abundance, that value is not considered significant in this study area.

5.2.1.2.1. Effects of No Action. Acreage of open and agricultural lands including prime and unique farmlands would decline as the development and zoning of the city continues. The trend of rapid conversion of cleared agricultural lands for urban and industrial use as occurred from the late 1950's through the early 1980's is not expected to continue, but will instead be replaced by a reduced rate of conversion. Projections of land use changes in the Amite River Basin were made by the Louisiana State Planning Office (LSPO) and are included in the report within Appendix B. The Jones Creek watershed is in the area described in that report as the Urban portion of the basin. Agricultural land is projected to decline due to development at a rate of approximately 3.48 percent per year in that area. The only components of the mitigation area that are in land zoned as agricultural are located in the Northeast portion of the parish. Agricultural land is projected to decline due to development at the low rate of 0.0634 percent per year in the Northeast portion. Although a decline in agricultural land is projected in the overall Jones watershed as well as the others, the exact area of potential project impact of prime and unique farmland for both construction and mitigation measures for project analysis purposes is projected to remain the same with no Federal action as currently exists.

5.2.1.2.2. Effects of Plan JCCL-P1. The construction of flood control features would result in no losses to this resource. The implementation of the combined mitigation plan (from all watersheds) would result in the conversion of approximately 282 acres of land zoned as prime and unique farmland use to wooded lands protected from any future agricultural crop production. An additional 115 acres of agricultural land would be converted by the combined mitigation plan, but that tract is not zoned as prime or unique farmland. Implementation of this alternative would consist of the conversion of prime and unique farmlands equal to approximately 25 percent of the combined mitigation plan

conversion. A request was made to the local representative of the Soil Conservation Service (SCS) regarding the effects of the project (including this alternative) upon landowners relative to the swampbuster provisions of the Food Security Act of 1985. The response received was negative as to any effect (see Appendix E, Section 6 for the Soil Conservation Service letter). The socio-economic effects of producing a commodity crop on those lands, if any may exist, are described in Paragraph 5.2.1.10.8. The analysis of the effects of the project (including the percentage made up by this alternative) relative to the FPPA is also included in Appendix E, Section 6.

5.2.1.2.3. Effects of Plan JCCL-P3. This alternative would result in similar effects as the previous plan, except implementation of this alternative would consist of the conversion of prime and unique farmlands equal to approximately 17 percent of the combined mitigation plan conversion.

5.2.1.2. BOTTOMLAND HARDWOOD FORESTS.

5.2.1.2.1. Significance. Forests of the overall study area (East Baton Rouge Parish) are made up of both natural forest communities and include some introduced ornamental plantings in the urban areas. Approximately 112,222 acres of the area were in forests in 1985 (see Table 5.2.1.2.1.). The term mixed hardwood is the local descriptive term for these lowland forests. The term bottomland hardwood is ecologically and physiographically correct for these forests, however, and is applicable to streambottom forests of the southeast that also contain associated loblolly and spruce pines (Whorton et al., 1982). Much of the forests in the study area are located on the Pleistocene terrace rather than on the alluvial floodplain. Within this natural forest is an area described by the Louisiana Natural Heritage Program as the Prairie Terrace Loess Forest community, which occurs on the terrace formation (see letter from the Louisiana Natural Heritage Program in Appendix E-4). However, this description does not remove this community from the overall bottomland hardwood category. Lowland forests intergrades into a beech-magnolia community on narrow ridges. Spruce pines are generally scattered to common on lowlands along the Comite River and are common to abundant along the Amite. Bottomland hardwoods of lower sites and including species that tolerate wetter conditions are common on the alluvial floodplain.

Some overstory hardwood species of the riparian and beech-magnolia community includes black willow and river birch (immediately adjacent to or within the banks of streams), as well as sweetgum, blackgum, water oak, cow oak, southern magnolia, American beech, white ash, yellow poplar, and red maple. Midstory and understory species include ironwood, eastern hopbornbeam, arrowwood, bigleaf snowbell, silverbell, sweetleaf, and sourwood. These plant communities commonly occur on Cascilla and Ochlockonee soil associations (Dance et al., 1968), which are silt loam and fine sandy loam overflow soils that are naturally flooded once or twice each year, but are well-drained. There are

hardwood forests occurring in the affected area that tolerate more prolonged flooding. These contain a much greater percentage of water oak, cow oak, and sweetgum in the overstory, with poison ivy as a common understory species. This forest type is typically found on Oliver-Calhoun-Loring soil associations and the Calhoun-Zachary-Frost associations. These soil associations are dominantly level, generally poorly drained to moderately well drained and occur on broad flats and in slight depressions. These forests clearly resemble the bottomland hardwood forests of the Mississippi Alluvial Valley. Forests occurring on soils between these conditions contain species of both upper and lower zones.

Forested lands within the overall region have value as timber resources. Even within the parish of East Baton Rouge the average annual removal for all species of growing stock for the period of 1974 through 1980 was 5.3 million cubic feet and for sawtimber was 25.0 million board feet (Thomas and Bylin, 1982). Processing markets are readily available for forest products either within, or in the proximity of, the study area. However, forestlands in the specific possible impact area (adjacent to the channels) have little value as timber resources since they are in such an highly urbanized area.

Some forestlands of the area are considered to be wetlands. Factors that identify areas as wetlands are hydrophytic vegetation, soil classification of hydric, and wetland hydrology. Wetland hydrology is a term used to describe the presence of permanent or periodic soil saturation for a significant period (normally a week or more) during the growing season. Areas adjacent to the Comite and Amite Rivers frequently are inundated by flooding during the growing season. However, the rise and fall of these rivers is a rapid process with out-of-bank flows commonly returning back to the rivers after the second day. Soils of the adjacent areas are typically coarse grained and are not known for their moisture retention capabilities. There are depressional areas or flats in the basin, however, where fine-grained soils are more prevalent. These soils are more likely to stay saturated for longer periods after significant storms. Wooded wetlands such as the depressional areas described above have functions of groundwater recharge, floodwater retention, habitat for fisheries, recreation, and others. However, the function considered most significant in these areas is wildlife habitat value. The goal of "no net loss" of wetlands is applicable to this portion of this resource category. The tables included in the land use resource category of this and other watersheds in this report include a category of wetlands. Baldcypress and/or tupelogum swamps make up the wetlands in these tables.

The habitat provided by bottomland hardwood forests is considered to be most significant of any habitat type of the area. Bottomland hardwood soils provide high fertility, readily available soil moisture, and associated high vegetative productivity. These forests are highly productive in wildlife carrying capacity because of these factors. Bottomland hardwood areas receiving winter inundation are utilized by migratory puddle ducks generally because of the acorns available but also because of the invertebrate fauna that

occurs in abundance in leaf litter on the wet forest floor (Hubert and Krull, 1973). Fredrickson (1980) reports that natural wooded wetlands provide protein sources that have a diversity of amino acids that are common to wood duck eggs. The value of bottomland forests to waterfowl species is affected by the amount of winter flooding. Increased flooding results in increased habitat value for waterfowl. Other wildlife species of bottomland hardwood forests, for which there is significant concern as game animals, include white-tailed deer, gray squirrel, swamp rabbit, raccoon, and wild turkey. In addition to raccoon, other furbearers include mink, Virginia opossum, red fox, and gray fox. Numerous passerine birds are found in this habitat while raptors such as barred owls, screech owls, and red shouldered hawks are common.

Lands adjacent to streams are described as riparian zones. The width of a riparian zone is very arbitrary in a forested area, but for the purpose of this study is considered to be 300 feet. The 300-foot width is the width used as an evaluation parameter in the United States Fish and Wildlife Service (USFWS) Habitat Suitability Index Model: North American Mink (Allen, 1986). Wooded riparian zones of the study area provide an especially valuable habitat to an abundance of animals because of the diversity of forest and shrub vegetation in the near proximity to flowing water. Most animals require access to water for survival even though they may spend most of their time elsewhere. The riparian zone provides protected access to water (Martin and Allen, 1988). Many small mammals, reptiles and amphibians are restricted to the riparian zone. Because of the abundance of insects, open areas for feeding and woody cover, forested riparian habitat provides vital nesting and feeding habitat for songbirds (Stauffer and Best, 1980). Population densities of birds breeding in riparian habitats are exceptionally high (Brinson et al., 1981). Migratory birds rely on riparian habitat to provide protection from predators and cover from the elements. Riparian ecosystems support a greater diversity of wildlife than non-water-related habitats (Brinson et al., 1981). Riparian vegetation provides the bulk of food, cover, and nesting habitat for much of the wildlife in the study area (Nunnally and Shields, 1985). Forested riparian zones are important in maintaining gene flow between wildlife populations because they are used as travel corridors for animals moving between forested tracts that otherwise would be separated by open areas. Wooded riparian areas also provide esthetically pleasing green areas in an otherwise agricultural and urban landscape.

Forested riparian areas also have high value in the maintenance of warmwater stream productivity. Adjacent and overhanging trees provide shade so that lower water temperatures and higher dissolved oxygen levels are maintained during critical hot weather periods. Forested riparian areas provide leaf litter which is the principal source of organic input to the aquatic system. Fallen trees and branches provide practically the only source of instream cover that exists. Riparian vegetation also retards bank erosion, retains flood waters, and filters sheetflow, thereby minimizing turbidity and detrimental excess nutrient inflow. The significance of riparian zones has been documented in numerous publications

(Teskey and Hinckley, 1977; Johnson and McCormick, 1978; Warner, 1979; Stauffer and Best, 1980; Brinson et al., 1981; Johnson et al., 1985; USDA Forest Service, 1987). The U.S. Congress recognized the value of riparian zones in the Wild and Scenic Rivers Act in 1968 which affords protection to rivers and their immediate environment. The Louisiana Legislature passed the Natural and Scenic Streams Act in 1970 to provide a mechanism for protecting rivers and adjacent riparian areas.

Forestlands of the study area also have high value from the visual perception of citizens of the urban area. Wooded areas provide living relief from the noise, congestion, and mechanization of the city. Wooded areas provide shade and relief to the citizenry from intense summer heat. Wooded areas provide the habitat including edge habitat for urban wildlife, the sights of which is enjoyed by residents and visitors to the city alike. Urban wildlife include species such as mockingbirds, brown thrashers, loggerhead shrikes, bluebirds, cardinals, jays, different species of woodpeckers, gray squirrels, and cottontail and swamp rabbits. Urban wooded areas serve as points of educational and scientific interest, especially for students in elementary grades, but even for higher grades and college-age students. Wooded strips serve as shields from objectionable views and also effectively serve as boundaries between properties and neighborhoods. Residential property values are often significantly enhanced when trees or wooded areas are present on the site. The International Society of Arboriculture (1979) presents a methodology for valuation of urban trees. This method produces values of individual urban trees at $18.00 per square inch of trunk caliper (diameter) resulting in values of $905, $1,413, and $2,036 for trees of eight, ten, and twelve inches, respectively, of trunk caliper.

5.2.1.2.2. Effects of No Action. The overall Jones Creek watershed is in an area of relatively fast development and is in the area described as the Urban portion of the parish (see land use analysis in Appendix J). The remaining watersheds discussed, Ward Creek, Bayou Fountain, Beaver Bayou, and Blackwater Bayou are in the Urban, Southern, Northeast, and Northwest portions, respectively. Table 5-2-1-2-1 presents past and projected acreage in forest land in the portions and the total of the parish. Although there is a trend of conversion of agricultural land to forested land throughout the region, this is not true for the study area due to the urban nature. Forested lands are being developed or converted to other uses at an annual rate of -2.2996 percent in this portion of the parish. The effects of no action to the wildlife species occupying that entire potentially impacted area are directly related to the changes in acres of that resource. The present and future amount of flooding to woodlands would result in little change to the existing very limited value to waterfowl in this urban area. Although a decline in forested land is projected in this overall watershed as well as the others, the area of potential project impact would not experience the same rate of conversion since it is contiguous to the existing channel. The development rate of the exact area of potential project impact is projected to maintain, with no Federal action, approximately 20 percent of the development rate of the remainder of the area.

TABLE 5-2-1-2-1
PAST AND PROJECTED FOREST ACREAGE
BY YEAR IN AREAS OF EAST BATON ROUGE PARISH [1]

Year	Urban	Northwest	Northeast	Central	Southern	Total
1978	10,316	28,603	53,579	11,703	14,105	118,306
1985	7,608	28,896	53,157	11,550	11,011	112,222
2040	3,061	27,739	52,596	10,548	2,711	96,655

[1] From Appendix J, Land Use Analysis

5.2.1.2.3. Effects of Plan JCCL-P1. Approximately 78 acres of wooded lands would be lost due to project construction measures. Habitat units lost due to project construction utilizing the U.S. Army Corps of Engineers Habitat Evaluation System (HES) would be 44 annualized habitat value (HUVs). A complete analysis of the HES evaluation and recommended mitigation is included in Appendix E, Section 1. Lost habitat value is fully compensated with the offsite mitigation measures implemented according to the HES. There would be no net loss of habitat value. The habitat losses and the recommended mitigation utilizing the U.S. Fish and Wildlife Service Habitat Evaluation Procedures (HEP) for this and all other watersheds are displayed in Appendix F. The evaluation was done only for the Recommended Plan for each watershed in the HEP. A total of 67.40 average annual habitat units (AAHU's) would be lost for all evaluation species as determined by the HEP for this alternative. Analysis of land use and stage frequency data for this and all other watersheds of the entire study area revealed that the impacts of stage reductions to the limited amount of wintering waterfowl habitat of this urban area were insignificant. The amount of forested wetlands upon which flooding would be reduced by this alternative, as well as any other action alternative of this or any other watershed, would be minimal in this urban area. The effects of visual losses of these resources are covered in the paragraphs on aesthetics. The location of the habitat mitigation sites adjacent to existing public use parks within the parish as possible will allow the public to benefit from those areas for nature enjoyment, scientific study, and diversity of land use. Loss of the value of individual trees to residents can be minimized if construction is conducted with a concern for minimization of those losses. Increased urban growth with some associated conversion of wooded lands may be an indirect effect of the proposed action.

5.2.1.2.4. Effects of Plan JCCL-P3. Implementation of this alternative would be very similar to Plan JCCL-P1. However, approximately 52 acres would be impacted by construction measures with a corresponding habitat loss of 29 HUVs. The offsite habitat mitigation plan developed would fully offset those habitat losses.

5.2.1.3. THREATENED AND ENDANGERED SPECIES

5.2.1.3.1. Resource Significance. Letter requests were made early in project design to the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) to determine if any listed threatened or endangered species or any species proposed for such listing occur in the study area. A similar request was also made to the Louisiana Natural Heritage Program (LNHP) for information on species of their concern. All of the agencies responded. Pertinent correspondence is included in Appendix E, Section 4. The NMFS replied initially with a list of species that may occur in the marine environment off coastal Louisiana. A responding letter sent by the District explained more specifically the location of the proposed work in relation to the marine environment and made the determination that the work would not effect the continued existence of any of the species listed in their initial letter. A subsequent letter received from the NMFS agreed with the determination that populations of endangered species under their purview would not be adversely affected by the proposed action.

A request was made in later stage project design to the USFWS explaining in more detail the kind and extent of proposed modifications. The USFWS did express a concern for the inflated heelsplitter, a threatened species, in the Amite River, and the bald eagle. However, due to the limited amount of work on the lower end of Jones Creek, they acknowledged that they anticipate no adverse affect to the inflated heelsplitter as a result of the proposed work. The USFWS mentions the concern for the bald eagle. A nest is in the vicinity of Bayou Fountain but has not been used since the 1990 nesting season. However, abandoned nests are monitored for five years after last known use. No mention was made of eagles nesting in any other watershed.

The LNHP replied early in project design that a significant natural habitat occurs on one of the watersheds, Ward Creek, on the Louisiana State University (LSU) Burden Research Plantation. They stated that the area is a virgin or old-growth Prairie Terrace Loess Forest that is currently registered with the Louisiana Natural Areas Registry Program (see Appendix E, Section 4).

The inflated heelsplitter, Potamilus inflatus, is a freshwater mussel, the existence of which is reportedly threatened by gravel dredging, flood control, and navigation interests. Stern (1976) reports the preferred habitat of the inflated heelsplitter is soft, stable substrates in slow to moderate currents. Hartfield (1988) reports it has been found in sand, mud, silt, and sandy-gravel, but not in large gravel or armored gravel. It is usually found on the protected side of bars and may occur in depths of over 20 feet. Limited amounts of siltation may suffocate juveniles whereas adults could survive. Historically, the heelsplitter occurred in the Tangipahoa River as well as the Amite River in Louisiana. It has not been reported from the Comite River. It also occurred in the Pearl River in Mississippi as well as the Tombigbee, Black Warrior, Alabama, and Coosa Rivers in Alabama. Recent

surveys indicate the heelsplitter is no longer found in the Alabama River, nor in the Coosa River, although the original records within the Coosa have been doubted. Also, the heelsplitter is no longer found in the Tangipahoa and Pearl Rivers. Populations within the remaining rivers have been much reduced. Listed species are accorded protection under the Endangered Species Act and are subject to its provisions, including Section 7.

The bald eagle, Haliaeetus leucocephalus, is a migratory raptor typically found in coastal areas or adjacent to lakes or rivers in Louisiana. Nesting in the South occurs from October 1 through May 15. Nests are found in large, prominent trees with tops sufficiently large to support nests of sizes that may reach as much as twelve feet in height and eight feet in width. A nesting territory is made up of the nest tree and several perch trees that may be located as much as one-quarter mile away from the nest tree. Tolerance to disturbance is least during egg laying, incubation, and the first several weeks after hatching. Fish is a favored food of eagles but waterfowl, typically coots in Louisiana, make up a large portion of the diet also. It is noted that the nest that was found is not in the Jones Creek Watershed.

5.2.1.3.2. Effects of No Action. Since the NMFS has indicated no species under their purview would be adversely effected by the proposed action, no further comments are appropriate regarding those species. However, the threatened status of the inflated heelsplitter indicates that activities in areas where these creatures exist may be causing a decline in populations. A definite statement, however, of whether this species would or would not be present for the next 50 years cannot be made with any degree of accuracy. The most limiting factor to the existence of the heelsplitter is the amount of activity of any action that abruptly cuts away or buries heelsplitter colonies in the Amite River. Naturally occurring transport of sediment caused by unrestricted flows including flood flows is evidently a necessary factor to the existence of the heelsplitter mussel. The current sediment transport capacity for the one-year event and the five-year event of 16,000 and 430,000 tons per day, respectively, on the Amite River near Bayou Manchac would be maintained. The remnant old-growth forest mentioned by the LNHP would probably be left intact since it receives a considerable amount of protection by being on the property of the LSU Research Plantation. However, this forest is limited to the Ward Creek watershed only. The eagle nest may not be used again if the use in recent years can be used as an indicator of future use.

5.2.1.3.3. Effects of Plan JCCL-P1. The eagle nest, and thus the nesting bald eagles, would not be affected by any plan since the nest is not located in this watershed. Implementation of this or any other alternative would result in essentially the same effects. Overall, the proposed channel improvements would not result in a reduction of flood runoff volume. Also, the frequency of peak discharges would remain essentially unchanged. The proposed improvements would affect conveyance. Concrete lining would increase conveyance, but would greatly reduce the source of sediment to be transported.

Bank erosion would be significantly reduced throughout a large part of the Jones Creek watershed; therefore, the amount of transported material would be minimized. Some erosion would still occur on the lower section of Jones Creek immediately below Jones Creek Road; however, erosion is not nearly as pronounced in that segment as in upstream segments of the watershed. The backwater effects of the Amite is a major factor influencing stages, conveyance, and sediment deposition at this area. The actual construction of the concrete lining or the actual clearing and snagging work, however, would result in immediate increases in turbidity levels during construction on the downstream segments that could be evident even in the Amite River at some times. Once within the river, the flows of the Amite would rapidly move any remaining sediment introduced by Jones Creek. In summary, it is anticipated that there would be little change in the transport capacity of the lower segment of Jones Creek near the Amite River. Furthermore, the transport capacity of the significantly larger Amite River is more than adequate to move any introduced materials without any anticipated adverse effects such as quick release of particles from suspension in the river and, thus, possible suffocation to the heelsplitter.

5.2.1.3.4. Effects of Plan JCCL-P3. The effects of this alternative would be very similar to the effects of the previous alternative but less pronounced since no work would be included on the tributaries.

5.2.1.4 AQUATIC RESOURCES

General. For the purpose of this document, aquatic resources of the study area are separated into water quality and ecological features.

5.2.1.4.1. Water Quality Features

5.2.1.4.1.1. Significance. The project streams located in the study area are not specifically listed in Louisiana's water quality standards. However, as they are all either tributaries, distributaries or interconnected streams of the Comite and Amite Rivers they all have primary contact recreation, secondary contact recreation and propagation of fish and wildlife as their designated water uses. No segments of the project streams, the Comite River or the Amite River in the study area are designated as outstanding natural resource waters. In 1988 the Louisiana Department of Environmental Quality (LDEQ) assessed the Comite River, from the entrance of White Bayou to the Amite River, as partially supportive of its designated water uses. This assessment was based on information other than current site-specific ambient water quality data, such as direct observations and general knowledge of the waterbody, location of pollution sources, citizen complaints, fish kill investigations, fishing success, and short-term intensive surveys and fisheries surveys. The LDEQ also assessed the Amite River, from La. Hwy. 37 to the Amite River Diversion Canal, as partially supportive of its designated water uses. This assessment was based

solely on current site-specific ambient water quality data. Dissolved oxygen concentrations and fecal coliform counts were the primary parameters of concern in this assessment.

Lake Maurepas, the eventual receiver of all waters from the East Baton Rouge Parish area, also has primary contact recreation, secondary contact recreation and propagation of fish and wildlife as its designated water uses. Based on information other than current site-specific ambient water quality data, the LDEQ has assessed Lake Maurepas as fully supportive of its designated water uses.

5.2.1.4.1.2. Effects of No Action. There is no indication that the water quality of the Comite River, Amite River, Lake Maurepas, or any of the East Baton Rouge Parish watersheds would worsen without the project. In fact, it seems that the water quality of the aforementioned waterbodies would improve as a result of the implementation of the best management practices as set forth in the Louisiana Water Quality Management Plan. Implementation of East Baton Rouge Parish's plan to divert a large portion of the municipal waste that is currently being discharged into tributaries of the Amite River into the Mississippi River would also improve the water quality in the aforementioned waterbodies.

5.2.1.4.1.3. Effects of Plan JCCL-P1. Both concrete lining and also clearing and snagging of channels are used to increase stream capacity for flood control. The impacts of concrete lining may be similar, but are much greater than those resulting from clearing and snagging. Stream bottoms and side slopes must be denuded of all vegetative materials to begin the work. Concrete surfaces leach out chemical substances. Mostly carbonates and hydroxides of calcium and magnesium come from cement mixing operations and from the cement itself. Although the greatest amount of leaching occurs during and immediately after construction, long-term leaching undoubtedly takes place.

Construction activities such as site preparation, development of access routes, and actual excavation causing the suspension of bottom sediments would result in increased turbidity levels in the above streams. The removal of any shading stream bank cover would elevate the temperature of the streams. Depressed oxygen levels would likely occur as the result of disturbing unoxidized bottom sediments having high chemical and biological oxygen demands, although the extent of reduced oxygen levels would largely depend on the nature of the disturbed sediment. Elutriate analyses indicates that there would not be any significant adverse water quality impacts associated with the resuspension or redissolving of heavy metals in the stream bed materials. No significant differences in nutrient and contaminant fecal levels are expected because these levels are usually related to types of land use and their distribution within the drainage basin. These impacts are temporary in nature and would diminish soon after the completion of the project. By and large, especially at times of moderate to high flows, channel improvements facilitate water flow and flushing. As a result of the increased assimilative capacity of the stream, the water

quality with respect to many parameters, and particularly dissolved oxygen content, may increase after the channel improvements. Also, clearing and snagging may remove many problem materials, thus speeding up the recovery time of a stream. This plan should not have any significant long-term impacts on Lake Maurepas. Short-term turbidity increases are expected in the Amite River. No adverse water quality impacts are anticipated as a result of any tree plantings or bike path on Jones Creek. In fact, any tree plantings on the streams would have positive water quality impacts, such as providing shade cover for the streams, preventing soil erosion and contaminant leaching from surface runoff into the streams, and precluding future development adjacent to the streams.

5.2.1.4.1.4. Effects of Plan JCCL-P3. The effects of this plan are similar to, but less adverse than Plan JCCL-1, since no construction would be conducted on any tributaries of Jones Creek.

5.2.1.4.2. Ecological Features

5.2.1.4.2.1. Significance. The watercourses of the area have limited significance from an ecological standpoint. Since their main function is conveyance for urban runoff, their ecological significance is simply because of their contribution to downstream habitats and not because of their high habitat value . Virtually all of the streams and channels in the area have been altered by prior enlargement or clearing and snagging activities. Woody vegetation has been removed from the side slopes in most portions within the heavily urbanized areas. Benthos is made up of organisms that can exist in bottoms of very low dissolved oxygen. Consequently, those habitats definitely do not support a significant population of harvestable sized sport or commercial fishes. However, those areas do support sufficient numbers of minnows, mosquitofish, and other forage species to provide food for other fishes higher up the food chain and for wading birds. The lowermost portion of Jones Creek (or any other stream) where the backwater effects of the receiving stream or river is most prominent, is the most valuable portion from a fisheries population standpoint.

5.2.1.4.2.2. Effects of No Action. This stream and its tributaries provide rather poor habitat. Since the entire input to the stream is urban runoff, and development is still occurring, any change would likely be a decline in aquatic habitat value. The lowermost portion in the proximity of the Amite River would continue to be heavily influenced by backwaters conditions of that watercourse. Channel banks would continue to be maintained by cutting of small trees with application of stump killers and by application of herbicides to the side slopes. The establishment of a native bermudagrass slope lining is the intended goal of the program. Expansion of the program is projected, therefore, native bermudagrass as well as some other resistant grasses would continue to survive. Tolerant minnows as well as other species inhabiting waters with low dissolved oxygen content would continue to survive.

5.2.1.4.2.3. Effects of Plan JCCL-P1. This plan consists of clearing and snagging of the lower 3.4 miles of Jones Creek and concrete lining of approx 16.3 miles of channels on Jones Creek and its tributaries. Concrete lining would initially provide an essentially barren substrate with nothing for burrowers to inhabit. However, after several rains sediments would accumulate and would then begin to provide a substrate sufficient for limited development of some benthic organisms. These organisms would not likely be of the type utilized by commercially important fish, but rather would be of the type tolerant to prolonged periods of low dissolved oxygen. The leaching of carbonates and hydroxides from calcium and magnesium from the concrete may restrict the development of organisms for some time but this would become more and more minimal with time. The forces of passing floodwaters readily removes easily erodible materials from concrete surfaces. Clearing and snagging would remove all accumulated obstructions including sediment accumulations at certain locations and would result in areas of denuded channel banks and channel bottoms. Trees would be cut and removed to the top of the bank line. The removal of the cover of grasses from channel slopes would allow unfiltered runoff and erosion from side slopes. However, post-construction grass plantings on those side slopes and top of bank would quickly minimize those impacts. The removal of snags where they occur would remove some diversity; however, very little exists in the area at present. Turbidity and instream temperatures would be increased as a result of clearing and snagging, but this would have little significant impacts on the fishery that is so degraded now. Aesthetic mitigation measures consisting of plantings of trees and shrubs in selected areas could eventually result in a band of adjacent trees along those portions of the channel where right-of-way is sufficiently wide to allow planting. From an ecological standpoint it would create shade, reduce water temperatures, and produce organic matter for input into the watercourse. This good type of organic matter rather than "poor input" (referring to runoff from lawns and industrial areas) would be a change to the source of productivity of the stream and the entire downstream system. Additionally, the off-site wildlife habitat mitigation measure for this alternative of reforestation of a designated acreage of open lands would provide a more desired source for runoff when considering the source of waters for this resource, than would lands in a cleared condition in the mitigation area. In sum, the implementation of this alternative would result in a negligible negative effect on aquatic productivity over the no action alternative when considering the entire length of the affected watercourse and the runoff from the mitigation area. Aquatic resources downstream of the construction area may receive higher water volumes and possibly higher stages over a reduced period during and immediately following very localized storms. When more widespread storms have resulted in higher stages in the receiving waters those effects would be less pronounced.

4.2.1.4.2.4. Effects of Plan JCCL-P3. This plan would consist of concrete lining and clearing and snagging, but would be confined to Jones Creek only. Approximately 3.4 miles would be cleared and snagged (as with Plan JCCL-P1) and 9.0 miles would be concrete lined. The overall effects of this alternative would be very similar but would be

less significant than the effects of Plan JCCL-P1. The benefits of mitigation measures would be similar to the previous plan.

5.2.1.5. CULTURAL RESOURCES

5.2.1.5.1. Significance. Channel maintenance or modification by non-federal entities has been conducted along virtually all of Jones Creek as well as the tributaries, Lively Bayou and Weiner Creek. The extent of these impacts was documented during a literature and records research coupled with reconnaissance fieldwork by Goodwin et al. (1990). This research was conducted as part of the current feasibility study. Louisiana State Site Records indicate there are three sites which may be located within the project area. Two of these (16EBR13, 16EBR26) have not been assessed in terms of their National Register significance. The Addison site (16EBR27), was reported to have been destroyed during the construction of Interstate 10 and is not significant (Goodwin et al. 1990).

5.2.1.5.2. Effects of No Action. Channelization, enlargement, and construction within the project area is likely to continue as urbanization continues. It appears unlikely that significant cultural resources will be encountered due to impacts already sustained to the project area.

5.2.1.5.3. Effects of Plans JCCL-P1 and JCCL-P3. The proposed plan for the project area consists of clearing and snagging the downstream segment of Jones Creek from its mouth to Jones Creek Road and widening and lining the upstream segment of Jones Creek and its tributaries. These tributaries consist of Weiner Creek, Lively Bayou and an unnamed tributary.

Investigations conducted during the feasibility study indicate that channel maintenance or modification has impacted virtually all of the project area (Goodwin et al. 1990). No further survey is planned in the project area. The State Historic Preservation Officer (SHPO) has been informed of the decision. Previous investigations have identified three archeological sites in the project area: 16EBR13, 16EBR26, and 16EBR27. Site 16EBR13 is located in the downstream portion of Jones Creek. Plans for clearing and snagging for this segment will not impact the site. The Palmar site (16EBR26) is described as an prehistoric midden, that may have been redeposited with other dredged material during previous channel maintenance. The site could be impacted by channel widening which is planned on Lively Bayou. Both 16EBR13 and 16EBR26 have not been assessed in terms of their National Register significance. Previous channel improvements appear to have impacted both sites and they are not expected to possess the quality of significance necessary for inclusion on the National Register. The Addison Site (16EBR27), was reported destroyed by highway construction by Goodwin et al. (1990). Therefore, no further work is required at this site. The SHPO has been informed of these recommendations (Appendix G).

5.2.1.6. RECREATION RESOURCES

5.2.1.6.1. Significance. East Baton Rouge Parish has an aggressive recreation program providing recreational sites and programs for urban and rural areas alike. Existing recreational areas in East Baton Rouge Parish include numerous local parks, neighborhood playgrounds, country clubs, a zoo, state commemorative areas, etc. The Recreation and Parks Commission for the Parish of East Baton Rouge (BREC) in their most recent reporting year (1992), reports 136 BREC facilities on a total of 3,840 acres. Attendance at these sites is estimated at 8,309,801 annually. Many programs were expanded and new programs were added by BREC. Improvement include an Art Gallery at City Park, 15 new centers, 26 new day camps, the Velodrome bike facility, a horse activity center, the fairgrounds, Highland Road tennis center, and many others. Golf courses within the BREC system registered 200,000 rounds of golf played in 1992. The Greater Baton Rouge Zoo experienced a total of 345,193 visitors as it observed its 20th anniversary. All of the 132 tennis courts were highly utilized with annual tournaments being held at most of the tennis centers. Other popular activities offered at BREC facilities include women's co–ed sports, basketball, baseball, football, and fun runs. BREC parks are generally located in neighborhoods within walking or biking distance from most of the potential users. These parks are equidistant from each other providing the opportunity for high neighborhood utilization. Few formal bicycle riding trails exist within the parish. Approximately 4.5 miles of Class I bikeways and 5.2 miles of Class II bikeways are present in East Baton Rouge Parish. Class I bikeways are bikeways which have a separate path for the exclusive use of bicycles. Class II bikeways generally consist of a shoulder of a roadway designated for preferential or exclusive use of bicycles.

5.2.1.6.2. Effects of No Action. The no action alternative would not impact existing or future recreation planned within East Baton Rouge Parish. However, population expansion in Baton Rouge would, in time, overload existing recreation facilities requiring additional park development to satisfy the greater demand. The Horizon Plan, a comprehensive land use plan developed by the East Baton Rouge City Planning Commission, and long range plans of BREC identify substantial recreational improvements, including bike trails, parks, and other features for future development.

5.2.1.6.3. Effects of Plan JCCL-P1. Implementation of the recreation development plan associated with this alternative is projected to provide approximately 45,000 bicyclist user days annually.

5.2.1.6.4. Effects of Plan JCCL-P3. The effects of this alternative would be similar to the previous alternative. However, since no work would be done on the tributaries, total miles of paths constructed would be reduced, and user days would not be as numerous.

5.2.1.7. AESTHETIC RESOURCES

5.2.1.7.1. Significance. Within East Baton Rouge Parish vegetation existing along the various drainage corridors provides a variety of aesthetic and ecological benefits. Erosion control, wildlife benefits, improvement of air quality and providing a scenic buffer zone, are positive attributes attributable to these vegetative linear green spaces. Vegetation existing along the stream banks also contributes to erosion control. The natural vegetative growth of horizontal root systems limits bank erosion and contributes to stable banks. The existing stream bank vegetation provides wildlife and bird habitats. In a world of concrete, gas fumes, industrial corridors, and shopping centers, the sightings of native birds and ground-dwelling wildlife is quite unique for a city. These green stream bank corridors provide nesting and feeding areas for native fauna. These stream corridors increase the abundance and diversity of wildlife in the city contributing to an overall aesthetic neighborhood experience. Another advantage of greenway corridors in the city is the reduction in pollution, creation of shade, and, thus, cooler spaces. In summer, shaded vegetated stream bank areas can be as much as ten degrees cooler than non-shaded areas. Air currents moving through the city over forested areas results in cooler air and lower humidity. Preservation of natural areas where trees and native shrubs are allowed to flourish assures that the associated aesthetic conditions are maintained. Greenways along stream banks provide a buffer zone decreasing the nuisance of lights, noise, visual unsightliness, etc., from the view of adjacent residents. Throughout the city, greenways screen non–compatible use from aesthetic degradation by providing a spacial separation between areas of different use within the city and by strengthening neighborhood identities.

5.2.1.7.2. Effects of No Action. Urbanization would continue to slowly diminish the remaining green spaces including those along the watercourses within the city. The demand for those areas would increase as the extent is diminished.

5.2.1.7.3. Effects of Plan JCCL-P1. Approximately 78 acres of wooded stream banks would be lost. Visual degradation would occur through the project loss of overstory hardwood trees of the beech–magnolia type such as sweetgum, blackgum, water oak, cow oak, southern magnolia, American beech, white ash, yellow poplar, and red maple. Midstory and understory species lost include ironwood, eastern hophornbeam, arrowwood, bigleaf snowbell, silverbell, sweetleaf, and sourwood. Removal of these trees along the upper stream bank corridor would delete the privacy and enclosure created by their presence. Trees adjacent to the stream provide aesthetic benefits to adjacent landowners. The removal of the stream bank riparian habitat and the associated wildlife would cause a corresponding loss to the overall aesthetic appeal.

The aesthetic mitigation plan consists of the planting of approximately 4.25 miles of trees and shrubs along the channel. The plan would return the lost green space, extensive screen of trees and shrubs, and rural feeling to this urban area (see Appendix E, Section 2).

Additionally, those trees planted as part of the recreation development plan would also add aesthetic appeal and shade to the bike path (see Appendix E, Section 3).

5.2.1.7.4. Effects of Plan JCCL-P3. Implementation of this alternative would be very similar to Plan JCCL—P1. However, aesthetic losses would be less since only 52 acres of stream bank vegetation would be lost. Therefore, less revegetation through new trees and shrubs would be needed.

5.2.1.8. NOISE.

5.2.1.8.1. Significance. Noise can be defined most simply as unwanted sound or sound in the wrong place at the wrong time. Noise can also be defined as any sound that is undesirable because it interferes with speech and hearing, is intense enough to damage hearing, or is otherwise annoying. Noise levels in the effected area are typically low in subdivisions and in outlying areas and are higher in the proximity of major streets and highways. The ambient dBA level in an urban residential community has been determined by the Environmental Protection Agency (EPA) to be 60. The ambient noise along a major traffic corridor would be higher, possibly to 70 dBA. East Baton Rouge Parish has established criteria or standards for environmental noise and has enacted them as a City/Parish ordinance. Maximum permissible noise levels measured in dBA (decibels) are listed in Sec.12:102 of that ordinance for different zonings throughout the day. However, an exception to these prohibitions is allowed by Sec. 12:103 (b)(3) which states "Nothing in this chapter shall be construed to prohibit, restrict, penalize, enjoin or in any manner regulate any federal, state or local governmental agency or any employee or agent of the same in the fulfillment of any official duty or activity sanctioned by or on behalf of the governmental agency."

5.2.1.8.2. Effects of No Action. Noise levels in less developed areas would be expected to increase moderately with the projected increase in residential and commercial growth.

5.2.1.8.3. Effects of Plan JCCL-P1 . Noise levels would essentially be increased for all plans during construction due to the operation of equipment. Since the overall area is highly developed, it is acknowledged that project noises would be heard by a large number of hearers both in commercial and residential areas. It is assumed that for this and each other alternative, the construction equipment would operate from 10 to 12 hours per day (depending upon the season), six days per week. Construction is projected to progress from the outlet end of the route to the inlet end. Noises associated with excavation and hauling of excavated material would progress gradually down the right-of-way. During certain phases of construction, noise impacts actually would be insignificant for certain periods of time. A decreasing circle of noise would be produced by the equipment as it moves along the construction route. The equipment (dozers, draglines, and hauling trucks) that would be working on the excavation would produce sound levels of approximately 102

dBA at 50 feet, 96 dBA at 100 feet, 90 dBA at 200 feet, and 84 dBA at 400 feet. Any specific location would be exposed to these levels for varying amounts of time. The total duration for project construction is projected to be approximately 72 months, 36 of which is projected for construction on the tributaries of Jones Creek. Therefore, construction noise could be heard at any time during daylight hours during that period. However, the total duration of work includes all activities some of which would be much quieter than the major construction activities. Also buildings and trees tend to restrict the effects of sound; therefore, construction noise may be muffled in some areas. EPA has a limit of 85 dBA for eight hours of continuous exposure to protect against permanent hearing loss. The decibel levels associated with channel construction would be higher than this, but for a relatively short duration; therefore, no hearing impairment should occur. Construction workers would have protective hearing devices. Since construction would take place during daylight hours, sleep interference should occur only for napping children and day sleepers. Noise affects many bodily functions (heart rate, respiratory volume, digestive secretions, hormonal secretions, etc.). If prolonged, the construction noise levels could produce significant physiological damage. However, the relatively short duration of the noise should prevent such problems. The noise would definitely be annoying to inhabitants of all buildings within 400 feet of the actual work site. During the time the noise is higher than 85 dBA, it would be difficult to hold a conversation within structures with little insulation from noise.

5.2.1.8.4. Effects of Plan JCCL-P3. The effects of this alternative would be very similar to the previous alternative; however, the projected duration of construction is 41 months.

5.2.1.9. VECTORS

5.2.1.9.1. Significance. Vectors in the project area include a variety of mosquitoes, the most common genera being Anopheles, Aedes, and Culex. Some species inhabit various habitats while others are more restricted. Some species, such as Aedes solicitans, breed only in temporary water while others, such as Culex salinarius, require permanent water for breeding. The most common vector-borne diseases are infectious equine anemia, anaplasmosis, and Venezuelan equine encephalitis.

5.2.1.9.2. Effects of No Action. No change in the present populations or factors affecting the populations of mosquitoes are projected in the project area. An active mosquito control program is presently in existence and is projected to be continued.

5.2.1.9.3. Effects of All Plans. Implementation of any alternative would result in no projected change in vector populations. Improved channels and adjacent top-of-bank areas would be shaped to eliminate the occurrence of standing water. Depressions made by equipment during construction would provide the potential for development of mosquito

habitat. Current controls should be adequate to maintain populations at desired levels. Control would be necessary if noticeable population increases occurred.

5.2.1.10. SOCIOECONOMIC RESOURCES

The purpose of this section is to describe the more significant social and economic conditions of the area and to identify potential impacts of various project alternatives, including no Federal action.

5.2.1.10.1. Land Use.

5.2.1.10.2. Significance. Table 5-2-1-10-1 shows historical land usage in East Baton Rouge Parish for 1972, 1978, and 1985. Urban land has increased dramatically largely at the expense of agricultural and forest lands.

The demand for urban land has originated largely from the growth of petro-chemical processing industries, deep-water port facilities, the development of state government, increases in higher education, and the need for additional residential developments. The state capitol and the main campuses of Louisiana State University (LSU) and Southern University are located in Baton Rouge.

5.2.1.10.1.2. Effects of No Action. The general effects of no action would include the continued level of flood hazard in the Jones Creek Watershed. Several of the sub-basins in this watershed are virtually completely developed at the present time. The trend of increasing urban growth can be expected to continue in those areas not fully developed

TABLE 5-2-1-10-1
Land Use In East Baton Rouge Parish
(in acres)

	1972	1978	1985
Urban	53,195	79,176	93,054
Agricultural	126,317	92,407	86,660
Forest	82,702	83,088	76,754
Water	1,100	867	1,130
Wetlands	5,357	6,917	6,593
Other	1,049	7,265	5,529
Totals	269,720	269,720	269,720

although probably not at the rate experienced during the late 1970's and early 1980's. Increases in urban land will occur through the continued conversion of agricultural and forest lands, influenced in part by an area's level of flood protection. 1985 land use for the Jones Creek Watershed is shown in Table 5-2-1-10-2. It is noted that the lack of wetlands shown in the table should not be interpreted that there are absolutely no wetlands in the watershed. It means that any wetlands in the watershed are so scattered and fragmented that they could not be picked up in the survey.

5.2.1.10.1.3. Effects of Plan JCCL-P1. The immediate effects of this plan on land use would be a reduction in the current level of flood hazard that threatens developments in the less protected areas of the watershed, primarily, residential developments. There would be no direct changes in land use due to construction.

TABLE 5-2-1-10-2
Jones Creek Watershed 1985 Land Use

Basin #	Urban	Agri	Forest	Water	Wetlands	Other	Total
22	8,272	725	1,703	0	0	30	10,730
23	1,120	0	30	0	0	0	1,150
24	1,969	143	793	0	0	200	3,105
28	1,602	107	61	11	0	48	1,829
Total	12,963	975	2,587	11	0	278	16,814

5.2.1.10.1.4. Effects of Plan JCCL-P3. Similar to Plan JCCL-P1 but with less flood reduction as no improvements are planned for the tributaries.

5.2.1.10.2. Housing.

5.2.1.10.2.1. Significance. Much of the urban land and some of the rural portion of the flood plain are used for residential development. The total number of housing units in East Baton Rouge Parish has increased steadily from 88,959 in 1970 to 133,635 in 1980 to 156,767 in 1990. The 1990 density of 344 housing units per square mile, as expected, is much higher than the state average of 39 per square mile.

5.2.1.10.2.2. Effects of No Action. The effect of no action, or the lack of any other flood control program, would result in the continued periodic flooding of those houses within the watershed that have inadequate flood protection. Recent survey of this watershed indicates

that approximately 1,532 residential structures have floor elevations at or below the current 100-year level of flood protection. Current insurance programs for homeowners encourage new construction to provide greater protection.

5.2.1.10.2.3. Effects of Plan JCCL-P1. Completion of this plan would substantially reduce the threat of flooding within the watershed. With the project in place, the number of residential structures with floor elevations at or below the 100-year level of protection would decline from 1,532 to 36.

5.2.1.10.2.4. Effects of Plan JCCL-P3. Similar to Plan JCCL-P1 but less of a reduction in the threat of flooding, since there is no improvements along the tributaries. This plan would leave approximately 465 residential structures at or below the 100-year level of protection.

5.2.1.10.3. Property Value.

5.2.1.10.3.1. Significance. Property values in East Baton Rouge Parish are influenced by a wide variety of factors, including the level of flood protection. Other factors influencing property values include such things as economic development, urban amenities, access to transportation systems, and proximity to scenic landscapes and recreational opportunities. All other things being equal, the unit values of protected land tends to be higher than unprotected land. This is particularly significant in or around urban developments where a wide variety of interests, both private and public, must compete for a limited amount of land. The potential for expansion in the Baton Rouge urbanized area is restricted by the Mississippi River to the west and south, and by wetlands to the south and east. These factors significantly influence existing and future property values. Table 5-2-1-10-3 shows the assessed valuation of property in East Baton Rouge Parish for the last 10 years.

5.2.1.10.3.2. Effects of No Action. Under no Federal action, the value of property with adequate flood protection in the watershed would tend to increase as the general economy of the Baton Rouge area improves and as the demand for development increased. The value of property without adequate flood protection, however, is unlikely to increase as rapidly and could eventually decline, as developers seek opportunities for investment elsewhere.

5.2.1.10.3.3. Effects of Plan JCCL-P1. The drainage improvements offered by this plan would tend to raise the value of existing developments where the potential for flood damage is the greatest. The value of undeveloped areas would also tend to rise. Concrete lining of the channel will eliminate erosion problems which should also improve property values.

TABLE 5-2-1-10-3
Assessed Valuation of Property
in East Baton Rouge Parish

Year	Value [1]
1979	907.8
1980	975.9
1981	1,035.3
1982	1,295.0
1983	1,337.0
1984	1,404.8
1985	1,509.2
1986	1,549.2
1987	1,545.2
1988	1,500.3

[1] Millions of Dollars.

5.2.1.10.3.4. Effects of Plan JCCL-P3. Impacts to property values would be similar to Plan JCCL-P1.

5.2.1.10.4. Business and Industry.

5.2.1.10.4.1. Significance. Business and industry in the vicinity of Baton Rouge have developed largely by the expansion of port activities, petro-chemical processing plants, and related sales and services. Wholesale, retail, and service industries have been attracted by these basic industries, as well as by the professional and technical needs of state government. Baton Rouge is also the location of the main campuses of Louisiana State University and Southern University. Table 5-2-1-10-4 shows the growth of business and industry in East Baton Rouge Parish.

5.2.1.10.4.2. Effects of No Action. Recent trends and the existing infrastructure suggest an eventual recovery of port activities and potential for continued economic growth, although at rates below those experienced during the rapid expansion of the Gulf Coast's oil boom.

5.2.1.10.4.3. Effects of Plan JCCL-P1. Improved flood protection would reduce physical damages to businesses and industries, as well as reduce possible disruption of normal business activities, with an accompanying income loss.

5.2.1.10.4.4. Effects of Plan JCCL-P3. Impacts would be similar to Plan JCCL-P1.

5.2.1.10.4.5. Employment.

5.2.1.10.4.5.1. Significance. Table 5-2-1-10-5 shows employment and unemployment trends for East Baton Rouge Parish. Employment increased for every year shown except 1983 which was due primarily to the decline in oil production and related petro-chemical industries. Unemployment increased dramatically during the 80's due to the aforementioned oil decline, fluctuations in port activities, and reductions in related services. In 1988, unemployment in East Baton Rouge Parish was about 8.3 percent while unemployment nationwide was reported to be 5.3 percent.

5.2.1.10.5.2. Effects of No Action. Employment is expected to increase as economic conditions improve during the 1990's. The rate of increase should be slightly greater than the populations increase, as a greater number of women join the work force.

TABLE 5-2-1-10-4
Business and Manufacturing Trends
East Baton Rouge

	1967	1977	1982	1987
Manufacturers				
# of establishments	194	291	306	323
# of employees	16,100	17,800	18,300	13,000
Wholesale Trade				
# of establishments	463	655	777	829
# of employees	5,414	8,539	11,101	9,308
Retail Trade				
# of establishments	1,902	2,441	2,850	2,331
# of employees	14,140	23,592	29,515	31,948
Services				
# of establishments	1,411	2,738	(N/A)	3,099
# of employees	5,408	14,392	25,771	29,387

5.2.1.10.5.3. Effects of Plan JCCL-P1. Employment generated by construction of the project would tend to be temporary. In addition to employment generated by construction of the project, the improved flood protection would indirectly help control overall economic development costs and enhance employment opportunities.

TABLE 5-2-1-10-5
Civilian Employment/Unemployment Trends
East Baton Rouge Parish

Employment	Civilian Labor Force	Employed	Unemployed	Unemployment Percent
1960	83,805	78,567	51,136	6.1
1970	107,422	102,577	4,845	4.5
1980	171,057	161,997	9,060	5.3
1983	174,600	160,000	14,600	8.4
1988	200,800	184,100	16,700	8.3

5.2.1.10.5.4. Effects of Plan JCCL-P3. Impacts would be similar to those of Plan JCCL-P1. The smaller project (no work on the tributaries) would reduce the effects of employment created directly by the project.

5.2.1.10.6. Community and Regional Growth.

5.2.1.10.6.1. Significance. Community and regional growth trends in the vicinity of Baton Rouge have been influenced largely by economic developments, including port and petrochemical activities, by the expansion of governmental services centered at the state capitol, and the growth of LSU and Southern University. As a result of this growth and continued population increase, this watershed and the parish have required additional flood protection.

5.2.1.10.6.2. Effects of No Action. Historically, growth has occurred from the Mississippi River to the east-southeast along Interstate Highway 10 and 12. Much of the land along the Jones Creek tributaries are fully developed so future growth should occur along the main stem located between the two interstate highways. Some growth would occur even without additional flood protection.

5.2.1.10.6.3. Effects of Plan JCCL-P1. Improved drainage throughout the entire watershed would facilitate continued growth from east to west.

5.2.1.10.6.4. Effects of Plan JCCL-P3. Impacts would be similar to Plan JCCL-P1.

5.2.1.10.7. Displacement of People.

5.2.1.10.7.1. Significance. As discussed in the section of Housing, some 1,532 residential structures are located within the 100-year flood zone. Assuming that the size of an average household within this zone is about the same as an average household in East Baton Rouge Parish as reported in the 1990 census, or 2.65 persons, the total population living within this 100-year flood zone is about 4,060.

5.2.1.10.7.2. Effects of No Action. The periodic flooding of some residences within the watershed could cause those living in the lower elevations to move, seeking shelter in more protected areas.

5.2.1.10.7.3. Effects of Plan JCCL-P1. Assuming the average number of persons per household within the 100-year flood zone would be 2.65 (similar to the number of persons per household living in East Baton Rouge Parish in 1990), this plan would reduce the total number of people i the 100-year floodplain from 4,000 to 100, a reduction of 3,900. Flooding which occurs with greater frequency, would also be reduced, reducing the possibility of displacement to people living in houses with less than 100-year flood protection. No relocation of residential structures will be required due to construction.

5.2.1.10.7.4. Effects of Plan JCCL-P3. The impacts would be similar to Plan JCCL-P1. An estimated 2,770 people currently living in the 100-year flood zone would no longer be subject to floods of this frequency, and possible displacement.

5.2.1.10.8. Displacement of Farms.

5.2.1.10.8.1. Significance. Agricultural land in East Baton Rouge Parish decreased by 40,000 acres from 1972 to 1985. While this acreage is decreasing, it still accounts for 32 percent of the total. Most of the remaining agriculture land is in the northern half of the parish and the extreme southern sub-basin of Bayou Fountain. As discussed previously, the pattern of urban expansion has resulted largely from the conversion of agricultural and forest land to urban uses.

5.2.1.10.8.2. Effects of No Action. Only 975 acres of agricultural land remain in this watershed. Under without-project conditions, a further decrease is expected as the population grows and changes in technology continue.

5.2.1.10.8.3. Effects of Plan JCCL-P1. Improved flood protection would probably have a minimal impact on farms in this watershed. The alternative, as well as any other flood control measure of this or any other watershed, would reduce the annual flooding on a minimal amount of wetlands, including farmed wetlands. These lands may be subject to the wetland conversion provisions of the Food Security Act of 1985 (Public Law 99-198).

These provisions discourage conversions of farmed wetlands and abandoned farmed wetlands for the production of an agricultural commodity. The means of discouraging such activities include sharply reducing the participating landowner or operator's eligibility in a number of USDA programs including any type of price support, certain farm loans including house loans, disaster payments, and crop insurance. Therefore, the financial consequences to any individual unfamiliar with Public Law 99-198 who produces agricultural commodities on farmed wetlands or even abandoned farmed wetlands that are converted (by the flood reductions of this alternative), could be severe. However, the District Conservationist of the USDA's Soil Conservation Service indicates (see Appendix E, Section 6) that there is very little land that would be classified as farmed wetland (that could be converted) within the area where flood reductions would be produced (wetlands converted) by the project. Construction features of this plan would not impact any agricultural land, however, 70 acres zoned as farmland would be converted to permanently forested land with implementation of the offsite mitigation feature.

5.2.1.10.8.4. Effects of Plan JCCL-P3. Impacts would be similar to Plan JCCL-P1, but fewer acres (47) zoned as farmland would be converted to permanently forested land with implementation of the offsite mitigation feature.

5.2.1.10.9. Public Facilities and Services.

5.2.1.10.9.1. Significance. Public facilities and services in East Baton Rouge Parish include roads, bridges, streets, utilities, schools, fire and police protection, waste disposal, and other facilities and services normally available in a metropolitan area. Baton Rouge is also the seat of state government and is the location of the main campuses of Louisiana State University and Southern University. Adequate drainage and flood control are necessary to sustain the continued maintenance and development of these public facilities and services.

5.2.1.10.9.2. Effects of No Action. The expansion of public facilities and services would probably follow previous patterns of population growth to the east-southeast along the interstate highways.

5.2.1.10.9.3. Effects of Plan JCCL-P1. With improved flood protection, economic developments and residential expansion would also probably follow previous patterns; and the demand for public facilities and services would follow as well. This plan would not require relocations of any public and quasi-public facilities and services (e.g. roads, bridges, pipelines, etc.).

5.2.1.10.9.4. Effects of Plan JCCL-P3. Similar impacts to Plan JCCL-P1.

5.2.1.10.10. Tax Revenues.

5.2.1.10.10.1. Significance. Tax revenues directly related to changes in the level of flood protection do not represent a major source of local or state revenues. More significant sources of revenue come from the collection of sales and income tax, only indirectly influenced by an area's level of flood protection.

5.2.1.10.10.2. Effects of No Action. Without additional flood protection in the marginally protected ports, economic development would be attracted to other areas where the potential for revenues would be greater.

5.2.1.10.10.3. Effects of Plan JCCL-P1. Improved flood protection could attract development in areas where protection is currently marginal or inadequate. The increased development and improved protection would help to maintain the stability of the tax base.

5.2.1.10.10.4. Effects of Plan JCCL-P3. Impacts would be similar to Plan JCCL-P1.

5.2.1.10.11. Community Cohesion.

5.2.1.10.11.1. Significance. Community cohesion can best be defined as a "sense of community" among members of a neighborhood, subdivision, or small community. While the general consensus of community opinion within East Baton Rouge Parish seems to support the level of flood protection required for economic and residential growth along traditional trends, concerns over the potential for adverse environmental impacts appear to have increased in recent years, including the impacts to fish and wildlife resources and scenic streams, as well as other conditions affecting human health and the quality of life. The environmental review process is designed to give the public an opportunity to comment on proposals influencing individual concerns and the concerns of the community at large. In general, the level of support expressed by local and state officials reflects the desires of the community.

5.2.1.10.11.2. Effects of No Action. If no action is taken to improve flood protection in the watershed, residents who are experiencing frequent flooding may eventually choose to relocate.

5.2.1.10.11.3. Effects of Plan JCCL-P1. Minimal impact to community cohesion as flood protection is improved with very little environmental changes.

5.2.1.10.11.4. Effects of Plan JCCL-P3. Similar impacts to Plan JCCL-P1.

5.2.2 **Ward Creek Basin**

5.2.2.1. AGRICULTURAL LANDS

5.2.2.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.1.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 7 percent of the combined mitigation plan conversion.

5.2.2.2. BOTTOMLAND HARDWOOD FORESTS

5.2.2.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.2.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek, but 22 acres and 12 HUVs, according to the HES, would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan. A total of 19.15 AAHU's would be lost for all evaluation species as determined by the HEP for this alternative.

5.2.2.3. THREATENED AND ENDANGERED SPECIES

5.2.2.3.1. Significance. This is the same as for this category under Jones Creek. It is noted that the eagle nest mentioned is not in the Ward Creek area.

5.2.2.3.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.3.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek. It is noted that flows from this watershed are deposited into Bayou Manchac. There sediments are slowly released from suspension and some finer materials would be transported to the Amite River. There would be no effects resulting from implementation of this alternative to the special old-growth wooded area of concern mentioned by the LNHP. Channel modification work would not extend upstream to that area, but would stop just downstream of Interstate 12.

5.2.2.4. AQUATIC RESOURCES

5.2.2.4.1. Water Quality Features

5.2.2.4.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.4.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.4.1.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek, but only 1.3 of the entire 14.2 miles to be modified would be concrete lined. The remainder would be cleared and snagged. Instream temperatures would be increased but the relatively short length of concrete lining would result in a comparatively small increase in temperatures throughout the remaining length. The temperature increases as a result of clearing and snagging would be much less pronounced.

5.2.2.4.2. Ecological Features

5.2.2.4.2.1. Significance. This is the same as for this category under Jones Creek. However, the Mississippi River levee borrow pits do provide nursery habitat for several species and also make a significant contribution to overall primary productivity. When the river recedes, however, there is no connection to allow fish to move between the two bodies. Thus, because of hot summer temperatures in the pits, fish inhabiting them are fish that are able to withstand prolonged periods of low dissolved oxygen levels.

5.2.2.4.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.4.2.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek. However, as as mentioned previously in paragraph 5.2.4.1.3., the limited amount of concrete lining would result in less bank modifications, which would result in a reduction in the amount of shading vegetation removed. The reduced amount of water temperature reduction would result in less impacts to any aquatic fauna that is sensitive to increased temperatures than would more extensive concrete lining. The deposition of excavated material into Mississippi River borrow pits would result in a reduction of the amount of aquatic habitat. Assuming borrow pit depths of 15 feet and 1 on 2 side slopes, approximately 7 acres would be filled with excavated material. This would be a change from habitat for fish to habitat for a variety of wetland creatures other than fish. Creatures using the areas would include mink, raccoon, crawfish, frogs, turtles, wading birds, and wintering waterfowl. Borrow pit habitat is rated as a habitat of medium to low value according to the USFWS habitat rating system. These habitats often have potential value as candidate areas for mitigating losses of another habitat. High water periods and winds would provide a seed source as well as inundating waters and willows would rapidly become established following minimal drying.

5.2.2.5. CULTURAL RESOURCES

5.2.2.5.1. Significance. Cultural resources investigations were completed for Ward Creek and the North Branch of Ward Creek during 1990 as part of the current feasibility study. The results of these investigations indicate that the project area has been extensively modified by channel enlargement and channel diversions. No significant cultural resources were encountered in the project area during these investigations and no significant cultural resources are anticipated. A review of the State Site Records indicates that two sites, 16EBR31 and 16EBR34, below the confluence of Bayou Duplantier and Dawson Creek, and one site, 16EBR77, adjacent to Ward Creek, are located in close proximity to the project area.

5.2.2.5.2. Effects of No Action. Channelization, enlargement, and construction withiS 1470 9551 _m¼

are unlikely to be encountered due to impacts already sustained to the project area.

5.2.2.5.3. Effects of Plan WCC-P4A5. The project calls for clearing and snagging of approximately 9.2 miles along Ward Creek, 3.7 miles of clearing and snagging along Dawson Creek, and concrete lining along 1.3 to 2.6 miles of North Branch of Ward Creek. Cultural resources investigations have been completed for portions of the project located along Ward Creek and North Branch of Ward Creek. Three archeological sites are recorded in close proximity to the project area (16EBR31, 16EBR34, and 16EBR77). Clearing and snagging in the vicinity of these sites should not impact the sites however, further efforts to assess the potential for project impacts will be conducted during the design phase of the project. The SHPO has been informed of these recommendations (Appendix G).

5.2.2.6. RECREATION RESOURCES

5.2.2.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.6.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.6.3. Effects of Plan WCC–P4A5. No recreation development is proposed under this plan since limited land is available in public ownership.

5.2.2.7. AESTHETICS

5.2.2.7.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.7.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.7.3. Effects of Plan WCC–P4A5. This is essentially the same for this category under Jones Creek. However, approximately 1.5 miles of stream bank vegetation would be lost on both sides along the upper bank of the north Branch tributary. This impacted area would require revegetation in order to return lost aesthetic quality. The 1.5 miles to be planted with the aesthetic mitigation plan would replace the lost aesthetic value.

5.2.2.8. NOISE

5.2.2.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.8.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.8.3. Effects of Plan WCC-P4A5. This is essentially the same as for this category under Jones Creek. The total duration for project construction is projected to be approximately 18 months.

5.2.2.9. VECTORS

5.2.2.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.9.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.2.9.3. Effects of Plan WCC-P4A5. This is the same as for this category under Jones Creek.

5.2.2.10. SOCIOECONOMIC RESOURCES

The purpose of this section is describe the more significant social and economic conditions of the area and to identify potential impacts of various project alternatives, including no Federal action.

5.2.2.10.1. Land Use.

5.2.2.10.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.1.2. Effects of No Action. The general effects of no action would include the continued level of flood hazard in the Ward Creek Watershed. As shown in Table 5-2-2-10-1, over 80 percent of the total land area is currently in urban use. Increased urban growth will continue through the continued conversion of agricultural and forest lands, influenced in part by the area's level of flood protection.

TABLE 5-2-2-10-1
Ward Creek Watershed 1985

Basin #	Urban	Agri	Forest	Water	Wetlands	Other	Total
21	4,853	704	896	0	0	21	6,474
25	3,916	91	460	302	0	2	4,771
26	2,674	140	91	0	0	0	2,905
27	4,698	18	109	0	0	19	4,844
30	1,585	415	207	0	0	0	2,207
Total	17,726	1,368	1,763	302	0	42	21,201

5.2.2.10.1.3. Effects of Plan WCC-P4A5. The immediate effects of the above plan on land use would be a reduction in the current level of flood hazard that threatens developments in the less protected areas of the watershed, primarily residential developmental. There are no direct changes in land use due to project construction.

5.2.2.10.2. Housing.

5.2.2.10.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.2.2. Effects of No Action. The effect of no action, or the lack of any other flood control program, would result in the continued periodic flooding of those houses within the watershed that have inadequate flood protection. Recent studies of this watershed indicate that approximately 1,123 residential structures have floor elevations at or below the 100-year level of flood protection. Current insurance programs for homeowners encourage new construction to provide greater protection.

5.2.2.10.2.3. Effects of Plan WCC-P4A5. Completion of this plan would reduce the threat of flooding within the watershed. With the project in place, the number of residential structures with floor elevations at or below the 100-year level of protection would decline from 1,123 to 787.

5.2.2.10.3. Property Value.

5.2.2.10.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.3.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.3.3. Effects of Plan WCC-P4A5. The drainage improvements offered by this plan would tend to raise the value of existing developments where the potential for flood damages is the greatest. The value of undeveloped area would also tend to rise.

5.2.2.10.4. Business and Industry.

5.2.2.10.4.1. Significance. This in the same as for this category under Jones Creek.

5.2.2.10.4.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.4.3. Effects of Plan WCC-P4A5. Improved flood protection would reduce physical damages to business and industries, as well as reduce possible disruption of normal business activities, with an accompanying income loss.

5.2.2.10.5. Employment.

5.2.2.10.5.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.5.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.5.3. Effects of Plan WCC-P4A5. Employment generated by construction of the project would tend to be temporary. In addition to this employment, the improved flood protection would indirectly help control overall economic development costs and enhance employment opportunities.

5.2.2.10.6. Community and Regional Growth.

5.2.2.10.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.6.2. Effects of No Action. This watershed is already one of the more urbanized in the parish. Growth should continue in this watershed along Interstate 10 even without additional flood protection.

5.2.2.10.6.3. Effects of Plan WWC-P4A5. Improved drainage throughout the watershed would facilitate expected continued growth.

5.2.2.10.7. Displacement of People.

5.2.2.10.7.1. Significance. As discussed in the section on Housing, some 1,123 residential structures are located within the 100-year flood zone. Assuming that the size of an average household within this zone is about the same as an average household in East

Baton Rouge Parish (2.65 persons - 1990 Census), the total population living within this 100-year flood zone is about 2,975.

5.2.2.10.7.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.7.3. Effects of Plan WCC-P4A5. Assuming the average number of persons per household within the 100-year flood zone would also be 2.65, this plan would reduce the total number of people in the 100-year floodplain from 2,975 to 2,085, a reduction of 890.

5.2.2.10.8. Displacement of Farms.

5.2.2.10.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.8.2. Effects of No Action. Agricultural lands in the watershed totaled nearly 1,400 acres in 1985. This number is expected to decrease as urban encroachment continues.

5.2.2.10.8.3. Effects of Plan WCC-P4A5. Minimal impacts to farmland in this watershed as it is already highly urbanized. Construction features of this plan would not impact any agricultural land, however, 20 acres zoned as farmland would be converted to permanently forested land with implementation of offsite mitigation.

5.2.2.10.9. Public Facilities and Services.

5.2.2.10.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.9.2. Effects of No Action. The expansion of public facilities and services would probably follow previous patterns of population growth to the east-southeast along Interstate 10.

5.2.2.10.9.3 Effects of Plan WCC-P4A5. With improved flood protection, the demand for public facilities and services would follow residential expansions along previous patterns of growth. This plan would not require any relocations of public and quasi-public facilities and services.

5.2.2.10.10. Tax Revenues.

5.2.2.10.10.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.10.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.10.3. Effects of Plan WCC-P4A5. Improved flood protection could attract development in areas where protection is currently marginal or inadequate. The increased development and improved protection would help to maintain the stability of the tax base.

5.2.2.10.11. Community Cohesion.

5.2.2.10.11.1. Significance. This is the same as for this category under Jones Creek.

5.2.2.10.11.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.2.10.11.3. Effects of Plan WCC-P4A5. Minimal impact to community cohesion as flood protection is improved with very little environmental change.

5.2.3. **Bayou Fountain Basin**

5.2.3.1. AGRICULTURAL LANDS

5.2.3.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.1.3. Effects of Plan BF10-A. This is essentially the same as for this category under Jones Creek, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 5 percent of the combined mitigation plan conversion.

5.2.3.1.3. Effects of Plan BF10-B. This is essentially the same as for Plan BF10-A.

5.2.3.2. BOTTOMLAND HARDWOOD FORESTS

5.2.3.2.1. Significance. This is the same as for this category under Jones Creek. However, there is a significant area of wooded wetlands just north of Bluebonnet Road and east of Highland Road. This area is a unique swamp area of cypress, red maple, green ash, and pumpkin ash in a sump within the terrace formation just before it descends into the alluvial floodplain at the edge of the Baton Rouge urban area. The area is a property of The Nature Conservancy (TNC). TNC acquires properties such as this that are under threat of destruction by development and that have some type of unique ecological characteristic. The plan is to preserve the area and to possibly develop the area into an educational park.

5.2.3.2.2. Effects of No Action. This is the same as for this category under Jones Creek. However, there is concern for preserving the degree of wetness of the wooded wetland

area just north of Bluebonnet Road and east of Highland Road. The degree of wetness would be determined primarily by the factors determining low-flow conditions of the watercourse that drains the area. The low-flow stages are determined by the depth of the channel below the Bluebonnet Road bridge, the invert or sill of the culvert under Highland Road, and the size of and restrictions within the channel between these bridges.

5.2.3.2.3. Effects of Plan BF10-A. This is essentially the same as for this category under Jones Creek, but 15 acres and 8 HUVs, according to the HES, would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan. The wooded wetland area just north of Bluebonnet Road and east of Highland Road would not be impacted by this alternative. This alternative would not affect any of the factors that determine the low-flow stages in the watercourse that drains the area.

5.2.3.2.3. Effects of Plan BF10-B. This is the same as for Plan BF-10A, but 17 acres and 9 HUVs would be lost due to flood control features. Neither would this alternative affect any factor that determines low-flow stages in the watercourse that drains the Bluebonnet swamp area. A total of 25.94 AAHU's would be lost for all evaluation species as determined by the HEP for this alternative.

5.2.3.3. THREATENED AND ENDANGERED SPECIES

5.2.3.3.1. Significance. This is the same as for this category under Jones Creek. However, the eagle nest mentioned (that currently is not being used) is located near this watershed.

5.2.3.3.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.3.3. Effects of Plan BF10-A. This is essentially the same as for this category under Jones Creek. The lower 4.4 miles of the channel modification would consist of clearing and snagging. As is true for Ward Creek, it is noted that flows from this watershed are also deposited into Bayou Manchac. There, as again true for Ward Creek, transported materials would slowly be released from suspension and some finer materials would be transported to the Amite River. The much larger volume and transport capacity of the Amite River would dilute and move any particles that would be delivered to it. Therefore, the inflated heelsplitter would not be affected by the implementation of this alternative. The clearing and snagging that is proposed near the area of the eagle nest would be scheduled to be done in that area in non-nesting periods if nesting activity is resumed again at that site or another site near the proposed work area. Therefore, if the eagles return to the area they would not be affected by the implementation of this alternative.

5.2.3.3.4. Effects of Plan BF10-B. This is the same as for Plan BF10-A.

5.2.3.4. AQUATIC RESOURCES

5.2.3.4.1. Water Quality Features

5.2.3.4.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.4.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.4.1.3. Effects of Plan BF-10A. This is similar for this category as that for Jones Creek, but only 2.9 of the total 8.1 miles to be modified would receive channel enlargement. The remainder would be cleared and snagged. The removal of any shading vegetation, whether by channel enlargement or by clearing and snagging would result in increases of water temperature. However, shading would occur more rapidly on cleared and snagged segments than on channel segments that are enlarged.

5.2.3.4.1.3. Effects of Plan BF-10B. This is essentially the same as for this category under Plan BF-10A. The additional 2.5 miles of clearing and snagging would result in some increases in water temperatures when compared to Plan BF-10A.

5.2.3.4.2. Ecological Features

5.2.3.4.2.1. Significance. This is the same as for this category under Ward Creek.

5.2.3.4.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.4.2.3. Effects of Plan BF-10A. This is similar for this category as under Ward Creek. The majority, 5.2 miles, of the modifications consist of clearing and snagging while the remaining 2.9 miles consist of channel enlargement. Channel enlargement will remove all forms of diversity of habitats, while clearing and snagging will still leave some diversity such as tree roots and some accumulated sediments in the channels. Both methods will include removal of overhanging vegetation, but channel enlargement will include removal of an approximate 25-foot band of trees along the banks, as available, for equipment access also. Organisms with limited mobility may be destroyed as the equipment works in the channel but any fish species likely to be found in these streams is normally sufficiently mobile to escape draglines and other construction equipment. Turbidity caused by the equipment would likely cause suffocation in the immediate area if organisms could not escape from the area. The deposition of excavated material into Mississippi River borrow pits would result in a reduction of the amount of aquatic habitat with an increase in wooded and wetland habitats. Assuming borrow pit depths of 15 feet and 1 on 2 side slopes, approximately 14 acres would be filled with excavated material. This would be a change from habitat for fish to habitat for a variety of wetland creatures

other than fish. Creatures using the areas would include mink, raccoon, crawfish, frogs, turtles, wading birds, and wintering waterfowl (see Ward Creek, Paragraph 5.2.2.4.2.3).

5.2.3.4.2.4. Effects of Plan BF-10B. This is the same for this alternative as for Plan BF-10A. However, because of the 2.5-mile increase in the amount of upstream clearing and snagging, that amount of additional adverse impacts would occur.

5.2.3.5. CULTURAL RESOURCES

5.2.3.5.1. Significance. There are presently six properties currently listed on or pending nomination to the National Register of Historic Places located in proximity to the project area. Planter's Cabin was nominated to the Register in 1984, the Joseph Pettitpierre House was nominated in 1986, Mount Hope Plantation was nominated in 1980, and the Lee Site (16EBR51) was nominated in 1984. Nominations are pending for Live Oak Plantation and the Ory House. In addition to the Lee Site (16EBR51), five archeological sites have been recorded in close proximity to the project area; sites included are 16EBR01, 16EBR04, 16EBR05, 16EBR65, and 16EBR67. All of these properties are located on the Prairie terrace surface which lies adjacent to the Bayou Fountain floodplain and the project area.

Literature and records research coupled with reconnaissance fieldwork was conducted under this feasibility study (Goodwin et al. 1990). Although no sites were recorded in the project area some evidence of disturbed remains of 20th century occupation exists. The fieldwork indicated that modern alluvial deposits of considerable thickness are present within the project area and any earlier cultural deposits are likely to be deeply buried. The disposition of known archeological sites, the settlement history of the project area, and the results of the fieldwork would indicate that the project area is assumed to contain a high probability for encountering significant cultural resources.

Historic records indicate a series of contiguous land grants fronting Bayou Fountain were made during the late eighteenth century. The area remained settled during much of the subsequent historic period. Significant remains associated with the late eighteenth through 20th century settlement of the area are anticipated to occur in deeply buried material throughout the entire project area.

5.2.3.5.2. Effects of No Action. Potentially significant cultural remains are expected to occur within deeply buried contexts adjacent to recorded archeological sites within on the floodplain of Bayou Fountain. Continued flooding would result in additional sediment infilling of the area further obscuring any unrecorded and potentially significant cultural resources. Channel migration of Bayou Fountain could expose and eventually erode potentially significant resources.

5.2.3.5.3. Effects of Plan BF10-A AND BF10-B. The project calls for improvements of approximately 11 miles of channel from the bayou's mouth to Ben Hur Road. Improvements will consists of clearing and snagging of the entire reach with the exception of a section between Siegen and Gardere Lanes. In this reach, the channel will be widened for construction of a concrete lined channel with a 50-foot bottom width. Prehistoric cultural remains are likely to occur adjacent to known archeological sites located on the adjacent Prairie terrace surface. Potentially significant cultural deposits associated with sites 16EBR1, 16EBR4, and 16EBR65 may occur within the reach where channel widening and lining are planned. Archeological deposits also are expected to occur within portions of the project adjacent to Site 16EBR5. This site is located on the Prairie terrace surface near the mouth of Bayou Fountain. Plans for clearing and snagging along this reach of the bayou should have no impact to significant cultural resources. Sites 16EBR51 and 16EBR67 are located in a large erosional gully that cuts into the surrounding Prairie terrace surface on the north side of Bayou Fountain. Plans for clearing and snagging will not impact the sites. No significant cultural resources are expected to occur in the area.

Up to four potentially significant archeological sites are expected to occur within deeply buried contexts in the project area. Clearing and snagging will not adversely impact any sites. Plans to widen and concrete line a portion of the channel from Siegen to Gardere Lanes has the potential for impacting potentially significant sites which may be located in this area. Intensive survey conducted during the design phase is recommended for the entire 11 mile project area. Any sites identified during these investigations will be evaluated in terms of their National Register significance and project impacts will be assessed. The SHPO has been informed of these recommendations (Appendix G).

5.2.3.6. RECREATION RESOURCES

5.2.3.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.6.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.6.3. Effects of Plan BF–10A. This is the same as for this category under the Ward Creek WCC–P4A5.

5.2.3.6.4. Effects of Plan BF–10B. This is the same as for this category under the Plan WCC–P4A5.

5.2.3.7. AESTHETICS

5.2.3.7.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.7.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.7.3. Effects of Plan BF—10A. Impacts to existing aesthetics and proposed mitigation techniques are essentially the same for this category as under Jones Creek. However, approximately 2.5 miles of stream bank vegetation would be lost along both sides of the upper bank of the Bayou Fountain within the impacted area of channel enlargement. This area would require re—vegetation in order to return lost aesthetic quality. The planting of trees and shrubs along both sides of 2.5 miles of stream would mitigate aesthetic losses.

5.2.3.7.4. Effects of Plan BF—10B. This is the same as for BF—10A plan.

5.2.3.8. NOISE

5.2.3.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.8.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.8.3. Effects of Plan BF-10A. This is essentially the same as for this category under Jones Creek. The total duration for project construction is projected to be approximately 18 months.

5.2.3.8.4. Effects of Plan BF-10B. This is the same as for BF—10A plan.

5.2.3.9. VECTORS

5.2.3.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.9.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.3.9.3. Effects of All Plans. This is the same as for this category under Jones Creek.

5.2.3.10. SOCIOECONOMIC RESOURCES

5.2.3.10.1. Significance. The purpose of this section is to describe the more significant social and economic conditions of the area and to identify potential impacts of various project alternatives, including no Federal action.

5.2.3.10.1. Land Use.

5.2.3.10.1.1. Significance. This the same as for this category under Jones Creek.

5.2.3.10.1.2. Effects of No Action. The general effects of no action would include the continued level of flood hazard in the Bayou Fountain Watershed. As shown in Table 5-2-3-10-1, this watershed is one of the more underdeveloped in the study area.

The trend of growth in urban land can be expected to continue through the conversion of agricultural and forest lands, influenced in part by the level of flood protection.

5.2.3.10.1.3. Effects of Plan BF-10A. The immediate effects of the above plan on land use would be a reduction in the current level of flood hazard that threatens developments in the less protected areas of the watershed. There are no direct changes in land use due to construction.

5.2.3.10.1.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A. Slightly more of a reduction in the flood hazard as clearing and snagging is conducted over a longer portion of the bayou.

TABLE 5-2-3-10-1
Bayou Fountain Watershed 1985 Land Use

Urban	6,420 acres
Agriculture	11,195 acres
Forest	3,881 acres
Water	53 acres
Wetlands	3,869 acres
Other	390 acres
Totals	25,808 acres

5.2.3.10.2. Housing.

5.2.3.10.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.2.2. Effects of No Action. The effect of no action, or the lack of any other flood control program, would result in the continued periodic flooding of those houses within the watershed that have inadequate flood protection. Recent surveys of this watershed indicate that approximately 405 residential structures have floor elevations at or below the current 100-year level of flood protection. Current insurance programs for homeowners encourage new construction to provide greater protection.

5.2.3.10.2.3. Effects of Plan BF-10A. Completion of this plan would reduce the threat of flooding within the watershed. With the project in place, the number of residential structures with floor elevations at or below the 100-year level of protection would decline

from 405 to 398. The main impact, however, would be the reduction of flood risk of many of these structures from a storm with a frequency of 25 years or less.

5.2.3.10.2.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.3. Property Value.

5.2.3.10.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.3.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.3.10.3.3. Effects of Plan BF-10A. The drainage improvements offered by this plan would tend to raise the value of existing developments where the potential for flood damage is the greatest. The value of undeveloped areas would also tend to rise.

5.2.3.10.3.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.4. Business and Industry.

5.2.3.10.4.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.4.2. Effects of No Action Plan. This is the same as for No Action in Jones Creek.

5.2.3.10.4.3. Effects of Plan BF-10A. Improved flood protection would reduce physical damages to businesses and industries, as well as reduce possible disruption of normal business activities, with an accompanying income loss.

5.2.3.10.4.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.5. Employment.

5.2.3.10.5.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.5.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.3.10.5.3. Effects of Plan BF-10A. Employment generated by construction of the project would tend to be temporary. In addition to this employment, the improved flood protection would indirectly help control overall economic development costs and enhance employment opportunities.

5.2.3.10.5.4. Effects of Plan BF-10B. Impacts would be similar to Plan BF-10A.

5.2.3.10.6. Community and Regional Growth.

5.2.3.10.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.6.2. Effects of No Action. This is a rapidly developing watershed located to the south and southeast of the Baton Rouge urbanized area. Major industrial sites are located along the Mississippi River portion of this watershed. It serves as the place of residence for workers in both Baton Rouge and the river industries. Growth is expected to continue even without additional flood protection.

5.2.3.10.6.3. Effects of Plan BF-10A. Improved drainage throughout the watershed would facilitate the expected continued growth.

5.2.3.10.6.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.7. Displacement of People.

5.2.3.10.7.1. Significance. As discussed i the section on Housing, some 405 residential structures are located within the 100-year flood zone. Assuming the size of an average household within this zone is about the same as an average household in East Baton Rouge Parish as reported in the 1990 Census, or 2.65 persons, the total population living within this 100-year flood zone is about 1,100.

5.2.3.10.7.2. Effects of No Action. The periodic flooding of some residences within the watershed could cause those living in the lower elevations to move, seeking shelter in more protected areas.

5.2.3.10.7.3. Effects of Plan BF-10A. Assuming the average number of persons per household would be 2.65 (similar to the 1990 Census number for East Baton Rouge Parish), this plan would reduce the total number of people in the 100-year floodplain from 1,100 to 1,050.

5.2.3.10.7.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.8. Displacement of Farms.

5.2.3.10.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.8.2. Effects of No Action. Over 43 percent of this watershed remains in agricultural lands. The 1985 total of 11,200 acres does, however, represents a decrease of 1,200 acres since 1978. Even without any project, the potential for urban growth in this area is great, as it is located near the city of Baton Rouge and to Louisiana State

University, and it borders on the Mississippi River which provides opportunities for industrial development.

5.2.3.10.8.3. Effects of Plan BF-10A. Improved flood protection would probably have minimal impact on farms in this watershed. Construction features of this plan would not impact any agricultural land, however, approximately 15 acres, zoned as farmland, would be converted to permanently forested land with implementation of the offsite mitigation feature.

5.2.3.10.8.4. Effects of Plan BF-10B. Impacts are similar to Plan BF-10A. Construction features would not impact any agricultural land, however, approximately 13 acres of zoned farmland would be set aside for offsite mitigation purposes.

5.2.3.10.9. Public Facilities and Services.

5.2.3.10.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.9.2. Effects of No Action. The expansion of public facilities and services would probably follow previous patterns of population growth to the east-southeast along Highland Road.

5.2.3.10.9.3. Effects of BF-10A Plan. With improved flood protection, economic developments and residential expansion would also probably follow previous patterns; and the demand for public facilities and services would follow as well. Relocation of one culvert and one petroleum pipeline would be required.

5.2.3.10.9.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.10. Tax Revenues.

5.2.3.10.10.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.10.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.3.10.10.3. Effects of Plan BF-10A. Improved flood protection could attract development in areas where protection is currently marginal or inadequate. The increased development and improved protection would help to maintain the stability of the tax base.

5.2.3.10.10.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.3.10.11. Community Cohesion.

5.2.3.10.11.1. Significance. This is the same as for this category under Jones Creek.

5.2.3.10.11.2. Effects of No Action Plan. This is the same as for No Action under Jones Creek.

5.2.3.10.11.3. Effects of Plan BF-10A. Minimal impact to community cohesion as flood protection is improved with very little environmental change.

5.2.3.10.11.4. Effects of Plan BF-10B. Similar impacts to Plan BF-10A.

5.2.4. **Beaver Bayou Basin**

5.2.4.1. AGRICULTURAL LANDS

5.2.4.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.1.3. Effects of Plan BBN-P1. This is essentially the same as for this category under Jones Creek, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 31 percent of the combined mitigation plan conversion.

5.2.4.1.4. Effects of Plan BBN-P2. This is the same as for Plan BBN-P1, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 31 percent of the combined mitigation plan conversion.

5.2.4.1.5. Effects of Plan BBN-P3. This is the same as for Plan BBN-P1, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 32 percent of the combined mitigation plan conversion.

5.2.4.2. BOTTOMLAND HARDWOOD FORESTS

5.2.4.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.2.3. Effects of Plan BBN-P1. This is essentially the same as for this category under Bayou Fountain except that all work would be by channel enlargement. However, 88 acres and 55 HUVs would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan.

5.2.4.2.4. Effects of Plan BBN-P2. This is essentially the same as for this category under Plan BBN-P1, but 86 acres and 54 HUVs would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan. A total of 142.77 AAHU's would be lost for all evaluation species as determined by the HEP for this alternative.

5.2.4.2.5. Effects of Plan BBN-P3. This is essentially the same as for this category under Plan BBN-P1, but 89 acres and 56 HUVs would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan.

5.2.4.3. THREATENED AND ENDANGERED SPECIES

5.2.4.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.3.2. Effects of No Action. This is the same as for this category under Jones Creek. However, the eagle nest mentioned (that currently is not being used) is not located near this watershed. The current sediment transport capacity for the one-year event and the five-year event of 29,400 and 250,000 tons per day, respectively, on the Amite River immediately downstream of the confluence of the Comite River would be maintained. Any sediment material that may be introduced by flood flows into the Amite River would become part of the system of sediments that is constantly being moved from the upstream end to the downstream end of the point bars within the river.

5.2.4.3.3. Effects of Plan BBN-P1. This is similar for this category as for Jones Creek. It is noted that within this basin 7.8 miles of channel above Frenchtown Road would receive channel enlargement. Channel enlargement would contribute to increased bank erosion. An estimated 110,000 cubic yards of sediments is projected to accumulate within and near the mouth of the main channel over a ten-year period with no action to prevent it. However, to minimize the expected erosion, a mat of geotextile material would be placed on the channel slopes to hold vegetation and, thus, the surrounding soil. This would not prevent, but would minimize the anticipated erosion. The transport capacity of the Comite River is sufficient to distribute any sediments that would eventually be introduced into it by the implementation of this alternative. Likewise, the transport capacity of the Amite River is sufficient to move any sediments eventually introduced into it by the Comite River. Any material that may be introduced would become part of the system of sediments that is constantly being moved from the upstream end to the downstream end of

the point bars within the river. Therefore, the inflated heelsplitter would not be affected by the implementation of this alternative.

5.2.4.3.4. Effects of Plan BBN-P2. This is the same as for Plan BBN-P1.

5.2.4.3.5. Effects of Plan BBN-P3. This is the same as for Plan BBN-P1.

5.2.4.4. AQUATIC RESOURCES

5.2.4.4.1. Water Quality Features

5.2.4.4.1.1. Significance. This is the same as for this category under Jones Creek; however, the source waters are not all from urban areas.

5.2.4.4.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.4.1.3. Effects of Plan BBN-P1. This is essentially the same as for this category under Jones Creek, but 7.8 miles of this watercourse and tributaries above Frenchtown Road would receive channel enlargement. Channel enlargement resulting in removal of overhanging vegetation would result in increases of stream temperature and reduced dissolved oxygen content. Removal of restrictions would contribute to more effective flushing actions.

5.2.4.4.1.4. Effects of Plan BBN-P2. This is essentially the same as for this category under Plan BBN-P1. The difference in excavation would make minimal difference in effects to water quality.

5.2.4.4.1.5. Effects of Plan BBN-P3. This is essentially the same as for this category under Plan BBN-P1. The difference in excavation would make minimal difference in effects to water quality.

5.2.4.4.2. Ecological Features

5.2.4.4.2.1. Significance. This is the same as for this category under Jones Creek. However, a portion of this watercourse begins in an agricultural area rather than an urban area. Therefore, the source waters are somewhat higher in ecological value than the previous basins of the overall study area discussed.

5.2.4.4.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.4.2.3. Effects of Plan BBN-P1. This is similar for this category as that for Jones Creek and for Bayou Fountain. However, all work would consist of channel enlargement.

The right-of-way necessary for the channel enlargement would most probably result in the complete removal of all overhanging vegetation over the watercourses except the largest trees. The accompanying increase of temperature may result in a change in species diversity towards aquatic species requiring lowered dissolved oxygen. Excavation for channel enlargement would result in complete destruction of the benthic community within the channels. Complete recolonization should occur in approximately one year. The geosynthetic mat on the channel slopes should help to provide microhabitats to which smaller organisms on the food chain would adhere. Those organisms would then provide a food source to higher organisms.

5.2.4.4.2.4. Effects of Plan BBN-P2. This is essentially the same as for this category under Plan BBN-P1. The difference in required excavation for different levels of protection would make negligible difference in affects upon aquatic resources as compared to the other alternative.

5.2.4.4.2.5. Effects of Plan BBN-P3. This is essentially the same as for this category under Plan BBN-P1. The difference in required excavation for different levels of protection would make negligible difference in affects upon ecological features of aquatic resources.

5.2.4.5. CULTURAL RESOURCES

5.2.4.5.1. Significance. Beaver Bayou cuts Pleistocene terrace surfaces through less highly developed country. An intensive pedestrian survey of the project area was completed by Bryant (1985). Two potentially significant sites were recorded as a result of the survey. The Biltmore Site (16EBR66), represents the remains of a prehistoric campsite dating from the Paleo-Indian or Early Archaic period. Shanks Cemetery was reported to contain approximately 30 grave markers with dates ranging from the 1870's to the 1930's. Previous channel modifications and improvements may have impacted both of these sites. Previous investigations provide information valuable for predicting the kinds and numbers of cultural resources which may be expected to occur within the project area and in other similar settings.

5.2.4.5.2. Effects of No Action. Channel maintenance or modification by non-federal entities has been conducted along the lower reaches of Beaver Bayou. The continuation of this program would presumably continue without federal involvement. Potentially significant archeological sites located along Beaver Bayou could be affected by future maintenance or modification projects. Without such a program, channel migration could expose and eventually erode as yet unrecorded potentially significant cultural resources.

5.2.4.5.3. Effects of Plans BBN-P1, P2, and P3. The proposed plan for Beaver Bayou consists of widening approximately 7.8 miles of channel designed to convey a 10, 25, or

50-year storm event within stream banks for each respective plan. Plans to widen the existing channel could severely impact any cultural resources located within the project area.

Cultural resources investigations have been completed for much of the project area. Investigations are required for the portion of Beaver Bayou from Hooper to Hubbs Roads. There are two sites recorded on Beaver Bayou downstream from Hooper Road. The National Register status of both the Biltmore site (16EBR66) and Shanks Cemetery is unknown. Only a portion of the cemetery is thought to be located within the project area however, right-of-way limits have not been established for this location.

Previous investigations indicate that the project area has a low probability for containing significant cultural resources. Although no significant cultural resources are expected to occur within previously unsurveyed portions of the project area the survey is recommended due to the severity of anticipated project impacts from widening. Two previously recorded sites, 16EBR66 and Shanks Cemetery have not been evaluated in terms of their National Register significance. If these sites are found to be within the area of project impact, efforts will be made to determine their significance and assess any project impacts during the design phase of the project. The SHPO has been informed of these recommendations (Appendix G).

5.2.4.6. RECREATION RESOURCES

5.2.4.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.6.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.6.3. Effects of Plan BBN-P1. This is the same as for this category under Plan WCC-P4A5.

5.2.4.6.4. Effects of Plan BBN--P2. This is the same as for this category under Plan BBN-P1.

5.2.4.6.5. Effects of Plan BBN--P3. This is the same as for this category under Plan BBN-P1.

5.2.4.7. AESTHETICS

5.2.4.7.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.7.3. Effects of Plan BBN--P1. Impacts to existing aesthetics and proposed mitigation techniques are similar to this category as under the Jones Creek plan, with the exception

that only trees are proposed. This creek is located in a rural setting where adjacent shrub, vine, and ground cover vegetation flourishes. In time, understory vegetation would encroach and voluntarily establish within the impacted corridor. Approximately 10.75 of stream bank vegetation would be lost along both sides of the upper bank of Beaver Bayou within the impacted area of channel enlargement. The hardwood tree plantings along that affected area would mitigate the lost aesthetic quality. Appendix E, Section 2 fully describes the details of the aesthetic mitigation planning.

5.2.4.7.4. Effects of Plan BBN–P2. Impacts to existing aesthetics and proposed mitigation are similar to the Beaver Bayou BBN–P1 plan. However, stream bank channel enlargement areas are different in magnitude than those above. Aesthetic mitigation through tree plantings would be adjusted according to the degree of impacts.

5.2.4.7.5. Effects of Plan BBN–P3. This is the same as for this category under Plan BBN–2 plan.

5.2.4.8. NOISE

5.2.4.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.8.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.8.3. Effects of Plans BBN-P1, P2, and P3. This is essentially the same as for this category under Jones Creek. The total duration for project construction is projected to be approximately 24 months for each of the alternatives.

5.2.4.9. VECTORS

5.2.4.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.9.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.4.9.3. Effects of all Plans. This is the same as for this category under Jones Creek.

5.2.4.10. SOCIOECONOMIC RESOURCES

The purpose of this section is to describe the more significant social and economic conditions of the area and to identify potential impacts of various project alternatives, including no Federal action.

5.2.4.10.1. Land Use.

5.2.4.10.1.1. Significance. This the same as for this category under Jones Creek.

5.2.4.10.1.2. Effects of No Action. The general effects of no action would include the continued level of flood hazard in the Beaver Bayou Watershed. Table 5-2-4-10-1 shows 1985 land use for this watershed. The trend of urban growth can be expected to continue through the continued conversion of agricultural and forest lands, influenced in part by the level of flood protection.

TABLE 5-2-4-10-1
Beaver Bayou Watershed 1985 Land Use

Urban	2,798 acres
Agriculture	3,629 acres
Forest	3,881 acres
Water	30 acres
Wetlands	28 acres
Other	107 acres
Totals	7,927 acres

The trend of urban growth can be expected to continue through the continued conversion of agricultural and forest lands, influenced in part by the level of flood protection.

5.2.4.10.1.3. Effects of Plan BBN-P1. The immediate effects of the above plan on land use would be a reduction in the current level of flood hazard that threatens developments in the less protected areas of the watershed, primarily residential developments. There are no direct changes in land use due to project construction.

5.2.4.10.1.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1. An increase in channel size would reduce the flood hazard slightly more.

5.2.4.10.1.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1. An increase in channel size would reduce the flood hazard slightly more.

5.2.4.10.2. Housing.

5.2.4.10.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.2.2. Effects of No Action. The effect of no action, or the lack of any other flood control program, would result in the continued periodic flooding of those houses within the watershed that have inadequate flood protection. Recent surveys of this watershed indicate that approximately 604 residential structures have floor elevations at or below the current 100-year level of flood protection. Current insurance programs for homeowners encourage new construction to provide greater protection.

5.2.4.10.2.3. Effects of Plan BBN-P1. Completion of this plan would reduce the threat of flooding within the watershed. With the project in place, the number of residential structures with floor elevations at or below the 100-year level of protection would decline from 604 to 353.

5.2.4.10.2.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1. With a larger channel size, only 286 residential structures would have floor elevations at or below the 100-year flood level.

5.2.4.10.2.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1. With a larger channel size, only 275 residential structures would have flood elevations at or below the 100-year flood level.

5.2.4.10.3. Property Value.

5.2.4.10.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.3.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.4.10.3.3. Effects of Plan BBN-P1. The drainage improvements offered by this plan would tend to raise the value of existing developments where the potential for flood damage is the greatest. The value of undeveloped areas would also tend to rise.

5.2.4.10.3.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1.

5.2.4.10.3.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1.

5.2.4.10.4. Business and Industry.

5.2.4.10.4.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.4.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.4.10.4.3. Effects of Plan BBN-P1. Improved flood protection would reduce physical damages to businesses and industries, as well as reduce possible disruption of normal business activities, with an accompanying income loss.

5.2.4.10.4.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1.

5.2.4.10.4.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1.

5.2.4.10.5. Employment.

5.2.4.10.5.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.5.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.4.10.5.3. Effects of Plan BBN-P1. Employment generated by construction of the project would tend to be temporary. In addition to this employment, the improved flood protection would indirectly help control economic development costs and enhance employment opportunities.

5.2.4.10.5.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1.

5.2.4.10.5.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1.

5.2.4.10.6. Community and Regional Growth.

5.2.4.10.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.6.2. Effects of No Action. This watershed, located to the northeast of urbanized Baton Rouge, is one of the more rural watersheds in the parish. It is not expected to grow as fast as the watersheds i the southern half of the parish that are located along the Interstate Highways. ion of this watershed. Its nearness to the urbanized areas should insure some growth.

5.2.4.10.6.3. Effects of Plan BBN-P1. Improved drainage throughout the watershed would facilitate whatever growth might occur.

5.2.4.10.6.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1.

5.2.4.10.6.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1.

5.2.4.10.7. Displacement of People.

5.2.4.10.7.1. Significance. As discussed in the section on Housing, some 604 residential structures are located within the 100-year flood zone. Assuming the size of an average household within this zone is about the same as an average household in East Baton Rouge Parish as reported in the 1990 Census, or 2.65 persons, the total population living within this 100-year flood zone is about 1,600.

5.2.4.10.7.2. Effects of No Action. The periodic flooding of some residences within this watershed could cause those living in the lower elevations to move, seeking shelter in more protected areas.

5.2.4.10.7.3. Effects of Plan BBN-P1. Assuming the average number of persons per household within the 100-year flood zone would be 2.65 (similar to the 1990 Census number for East Baton Rouge Parish), this plan would reduce the total number of people in the 100-year floodplain from 1,600 to 935, a reduction of 665.

5.2.4.10.7.4. Effects of Plan BBN-P2. The impacts would be similar to Plan BBN-P1. An estimated 840 people currently living in the 100-year flood zone would no longer be subject to floods of this frequency and possible displacement.

5.2.4.10.7.5. Effects of Plan BBN-P3. The impacts would be similar to Plan BBN-P1. An estimated 870 people currently living in the 100-year flood zone would no longer be subject to floods of this frequency and possible displacement.

5.2.4.10.8. Displacement of Farms.

5.2.4.10.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.8.2. Effects of No Action. This watershed is near the eastern edge of East Baton Rouge Parish and, thus, it is more rural in character than those watersheds closer to downtown Baton Rouge. The 1978 agricultural acreage of 3,725 has decreased only to 3,629 in 1985. Some decrease in this acreage is expected due to conversion to urban land even without a project.

5.2.4.10.8.3. Effects of Plan BBN-P1. Improved flood protection would probably have a minimal impact on farms in this watershed. Construction features of this plan would not impact any agricultural land, however, 89 acres, zoned as farmland, would be converted to permanently forested land with implementation of the offsite mitigation feature.

5.2.4.10.8.4. Effects of Plan BBN-P2. Impacts would be similar to Plan BBN-P1 with 87 acres of zoned farmland required for offsite mitigation.

5.2.4.10.8.5. Effects of Plan BBN-P3. Impacts would be similar to Plan BBN-P1 with 90 acres of zoned farmland required for offsite mitigation.

5.2.4.10.9. Public Facilities and Services.

5.2.4.10.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.9.2. Effects of No Action. The expansion of public facilities and services would follow any future population growth. This growth is expected to be slow.

5.2.4.10.9.3. Effects of Plan BBN-P1. Improved flood protection should facilitate the slow growth in this watershed along with an increase in demand for public facilities and services. The channel enlargement in this plan would require the relocation of 6 bridges, 4 pipelines, 3 waterlines, and 5 culverts.

5.2.4.10.9.4. Effects of Plan BBN-P2. Similar impacts to Plan BBN-P1.

5.2.4.10.9.5. Effects of Plan BBN-P3. Similar impacts to Plan BBN-P1.

5.2.4.10.10. Tax Revenues.

5.2.4.10.10.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.10.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.4.10.10.3. Effects of Plan BBN-P1. Improved flood protection could attract development in areas where protection is currently marginal or inadequate. The increased development and improved protection would help to maintain the stability of the tax base.

5.2.4.10.10.4. Effects of Plan BBN-P2. Similar impacts to Plan BBN-P1.

5.2.4.10.10.5. Effects of Plan BBN-P3. Similar impacts to Plan BBN-P1.

5.2.4.10.11. Community Cohesion.

5.2.4.10.11.1. Significance. This is the same as for this category under Jones Creek.

5.2.4.10.11.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.4.10.11.3. Effects of Plan BBN-P1. Minimal impact to community cohesion as flood protection is improved with very little environmental change.

5.2.4.10.11.4. Effects of Plan BBN-P2. Similar impacts to Plan BBN-P1.

5.2.4.10.11.5. Effects of Plan BBN-P3. Similar impacts to Plan BBN-P1.

5.2.5. **Blackwater Bayou Basin**

5.2.5.1. AGRICULTURAL LANDS

5.2.5.1.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.1.3. Effects of Plan BW-P2. This is essentially the same as for this category under Jones Creek, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 32 percent of the combined mitigation plan conversion.

5.2.5.1.3. Effects of Plan BW-P4. This is essentially the same as for Plan BF10-A, but implementation of mitigation for this alternative would consist of the conversion of prime and unique farmlands equal to approximately 55 percent of the combined mitigation plan conversion.

5.2.5.2. BOTTOMLAND HARDWOOD FORESTS

5.2.5.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.2.3. Effects of Plan BW-P2. This is essentially the same as for this category under Beaver Bayou Plan BBN-P1, but 77 acres and 48 HUVs would be lost due to construction of flood control features. These losses would be fully compensated with the habitat mitigation plan. A total of 127.85 AAHU's would be lost for all evaluation species as determined by the HEP for this alternative.

5.2.5.2.3. Effects of Plan BW-P4. This is the same as for Plan BW-P2, but 141 acres and 88 HUVs would be lost by flood control features caused by additional construction required for the higher level of protection.

5.2.5.3. THREATENED AND ENDANGERED SPECIES

5.2.5.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.3.2. Effects of No Action. This is the same as for this category under Jones Creek and Beaver Bayou.

5.2.5.3.3. Effects of Plan BW-P2. This is essentially the same as for this category under Beaver Bayou Plan BBN-P1. However, with no action to prevent it, a projected 145,000 cubic yards of materials would accumulate within and near the mouth of the main channel and its tributary. Again, the geotextile mat mentioned for Beaver Bayou would also be utilized in this watershed to minimize this projected erosion. The transport capacity of the Comite River is sufficient to distribute any sediments that would eventually be introduced into it by the implementation of this alternative. Likewise, the transport capacity of the Amite River is sufficient to move any sediments eventually introduced into it by the Comite River. Therefore, the inflated heelsplitter would not be affected by the implementation of this alternative.

5.2.5.3.4. Effects of Plan BW-P4. This is the same as for Plan BBN-P2.

5.2.5.4. AQUATIC RESOURCES

5.2.5.4.1. Water Quality Features

5.2.5.4.1.1. Significance. This is the same as for this category under Jones Creek. However, this watercourse begins in an agricultural and forested area rather than an urban area. Therefore, the quality of source waters is higher than the previous basins of the overall study area discussed.

5.2.5.4.1.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.4.1.3. Effects of Plan BW-P2. This is similar for this category as that for Beaver Bayou BBN-P1. However, 13.4 miles of this watercourse and a tributary would receive channel enlargement.

5.2.5.4.1.3. Effects of Plan BW-P4. This is the same as for this category under Plan BW-P2 other than for the different level of protection.

5.2.5.4.2. Ecological Features

5.2.5.4.2.1. Significance. This is the same as for this category under Jones Creek. However, because of higher water quality, the source waters are higher in ecological value than the previous basins of the overall study area discussed.

5.2.5.4.2.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.4.2.3. Effects of Plan BW-P2. This is similar for this category as that for Beaver Bayou Plan BBN-P1. As with that alternative, all work would consist of channel enlargement.

5.2.5.4.2.4. Effects of Plan BW-P4. This is the same for this category as for Blackwater Bayou Plan BW-P2 other than for the different level of protection.

5.2.5.5. CULTURAL RESOURCES

5.2.5.5.1. Significance. The proposed plan for Blackwater Bayou and its main tributary consists of widening approximately 13.4 miles of channel designed to convey a 10-year storm event within stream bank. Plans to widen the channel could severely impact any cultural resources located within the project area. Investigations conducted during the feasibility study indicate that similarities exist in the number and kinds of cultural resources found along both Blackwater and Beaver bayous (Goodwin et al. 1990). The project area is considered to have a low probability for containing significant cultural resources. The Blackwater Bayou Site (16EBR33) and 16EBR66 on Beaver Bayou, appear similar in age and presumed function also. Both sites appear to represent campsites which date from the Paleo-Indian or Early Archaic period. Impacts at 16EBR33 include both residential construction and drainage improvements. The National Register eligibility has not been determined for this site.

5.2.5.5.2. Effects of No Action. Channel migration could expose and eventually erode potentially significant cultural resources.

5.2.5.5.3. Effects of Plan BW-P2 and BW-P4. Similarities to Beaver Bayou indicate the project area has a low probability for containing significant cultural resources. However, intensive investigations should be undertaken prior to the next phase of work. The proposed project has potential for adversely affecting one previously recorded potentially significant archeological site (16EBR33). An attempt should be made to identify site limits with relation to the project boundaries and make a final determination of eligibility prior to construction of the project features. The SHPO has been informed of these recommendations (Appendix G).

5.2.5.6. RECREATION RESOURCES

5.2.5.6.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.6.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.6.3. Effects of Plan BW—P2. This is the same as for this category under Plan WCC—P4A5.

5.2.5.6.4. Effects of Plan BW—P4. This is the same as for this category under Plan BW-P2.

5.2.5.7. AESTHETICS

5.2.5.7.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.7.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.7.4. Effects of Plan BW—P2. Impacts to existing aesthetics and proposed mitigation are similar to Plan BBN—P1. However, the extent of stream bank channel enlargement areas is different. The 13.5 miles of tree plantings would mitigate the losses of these resources.

5.2.5.7.5. Effects of Plan BW—P4. This is the same as for this category under Plan BW—P2 plan.

5.2.5.8. NOISE

5.2.5.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.8.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.8.3. Effects of Plan BW-P2. This is essentially the same as for this category under Jones Creek. The total duration for project construction is projected to be approximately 18 months.

5.2.5.8.4. Effects of Plan BW-P4. This is the same as for this category as under Plan BW-P2.

5.2.5.9. VECTORS

5.2.5.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.9.2. Effects of No Action. This is the same as for this category under Jones Creek.

5.2.5.9.3. Effects of All Plans. This is the same as for this category under Jones Creek.

5.2.5.10. SOCIOECONOMIC RESOURCES

The purpose of this section is to describe the more significant social and economic conditions of the area and to identify potential impacts of various project alternatives, including no Federal action.

5.2.5.10.1. Land Use.

5.2.5.10.1.1. Significance. This the same as for this category under Jones Creek.

5.2.5.10.1.2. Effects of No Action. The general effects of no action would include the continued level of flood hazard in the Blackwater Bayou Watershed. Table 5-2-5-10-1 shows 1985 land use for this watershed. The trend of urban growth can be expected to continue through the continued conversion of agricultural and forest lands, influenced in part by the level of flood protection.

5.2.5.10.1.3. Effects of Plan BW-P2. The immediate effects of the above plan on land use would be a reduction in the current level of flood hazard that threatens developments in the less protected areas of the watershed, primarily residential developments. There are no direct changes in land use due to project construction.

TABLE 5-2-5-10-1
Blackwater Bayou Watershed 1985 Land Use

Urban	2,882 acres
Agriculture	3,716 acres
Forest	2,743 acres
Water	0 acres
Wetlands	0 acres
Other	0 acres
Totals	9,341 acres

5.2.5.10.1.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2.

5.2.5.10.2. Housing.

5.2.5.10.2.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.2.2. Effects of No Action. The effect of no action, or the lock of any other flood control program, would result in the continued periodic flooding of those houses within the

watershed that have inadequate flood protection. Recent studies of this watershed indicate that approximately 866 residential structures have floor elevations at or below the current 100-year level of flood protection. Current insurance programs for homeowners encourage new construction to provide greater protection.

5.2.5.10.2.3. Effects of Plan BW-P2. Completion of this plan would substantially reduce the threat of flooding within the watershed. With the project in place, the number of residential structures with floor elevations at or below the 100-year level of protection would decline from 866 to 642.

5.2.5.10.2.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2 with a slightly greater reduction of the flood threat, since this channel would accommodate a larger flow. This plan would leave approximately 461 residential structures at or below the 100-year level of protection.

5.2.5.10.3. Property Value.

5.2.5.10.3.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.3.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.5.10.3.3. Effects of Plan BW-P2. The drainage improvements offered by this plan would tend to raise the value of existing developments where the potential for flood damages is the greatest. The value of undeveloped areas would also tend to rise.

5.2.5.10.3.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2.

5.2.5.10.4. Business and Industry.

5.2.5.10.4.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.4.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.5.10.4.3. Effects of Plan BW-P2. Improved flood protection would reduce physical damages to businesses and industries, as well as reduce possible disruption of normal business activities, with an accompanying income loss.

5.2.5.10.4.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2.

5.2.5.10.5. Employment.

5.2.5.10.5.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.5.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.5.10.5.3. Effects of Plan BW-P2. Employment generated by construction of the project would tend to be temporary. In addition to this employment, the improved flood protection would indirectly help control overall economic development costs and enhance employment opportunities.

5.2.5.10.5.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2.

5.2.5.10.6. Community and Regional Growth.

5.2.5.10.6.1. Significance. This is the same for this category as under Jones Creek.

5.2.5.10.6.2. Effects of No Action. As this watershed is one of the more rural in the parish. not as much growth is expected as in those watersheds along the two interstate highways. However, some growth would occur even without additional flood protection.

5.2.5.10.6.3. Effects of Plan BW-P2. Improved drainage throughout the watershed would facilitate whatever growth might occur.

5.2.5.10.6.4. Effects of Plan BW-P4. Impacts would be similar to Plan BW-P2.

5.2.5.10.7. Displacement of People.

5.2.5.10.7.1. Significance. As discussed in the section on Housing, some 800 residential structures are located within the 100-year flood zone. Assuming that the size of an average household within this zone is about the same as an average household in East Baton Rouge Parish as reported in the 1990 Census, or 2.65 persons, the total population living within this 100-year flood zone is about 2,120.

5.2.5.10.7.2. Effects of No Action. This is the same as for No Action under Jones Creek.

5.2.5.10.7.3. Effects of Plan BW-P2. Assuming the average number of persons per household within the 100-year flood zone would be 2.65 (similar to the 1990 Census numbers for East Baton Rouge Parish), this plan would reduce the total number of people in the 100-year floodplain from 2,300 to 1,675, a reduction of 625.

5.2.5.10.7.4. Effects of Plan BW-P4. The impacts would be similar to Plan BW-P2. An estimated 1,100 people currently living in the 100-year flood zone would no longer be subject to floods of this frequency and possible displacement.

5.2.5.10.8. Displacement of Farms.

5.2.5.10.8.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.8.2. Effects of No Action. Over 3,700 acres of agricultural land remain in this watershed. Even under without-project conditions, a further decrease is expected as the population grows and changes in technology continue.

5.2.5.10.8.3. Effects of Plan BW-P2. Improved flood protection would probably have a minimal impact on farms in this watershed. Construction features of this plan would not impact any agricultural land, however, 90 acres zoned as farmland would be converted to permanently forested land with implementation of the offsite mitigation feature.

5.2.5.10.8.4. Effects of Plan BW-P4. Impacts are similar to Plan BW-P2. Construction features would not impact any agricultural land, however, as this plan involves greater channel enlargement, more farmland acres (154) will be set aside for offsite mitigation purposes.

5.2.5.10.9. Public Facilities and Services.

5.2.5.10.9.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.9.2. Effects of No Action. The expansion of public facilities and services would follow any future population growth. This growth is expected to be very slow.

5.2.5.10.9.3. Effects of Plan BW-P2. Improved flood protection should facilitate the slow growth in this watershed along with an increase in demand for public facilities and services. The channel enlargement in this plan would require the relocation of 11 bridges, 5 pipelines, and 2 power lines.

5.2.5.10.9.4. Effects of Plan BW-P4. Similar impacts to Plan BW-P2.

5.2.5.10.10. Tax Revenues.

5.2.5.10.10.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.10.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.5.10.10.3. Effects of Plan BW-P2. Improved flood protection could attract development in areas where protection is currently marginal or inadequate. The increased development and improved protection would help to maintain the stability of the tax base.

5.2.5.10.10.4. Effects of Plan BW-P4. Similar impacts to Plan BW-P2.

5.2.5.10.11. Community Cohesion.

5.2.5.10.11.1. Significance. This is the same as for this category under Jones Creek.

5.2.5.10.11.2. Effects of No Action. This is the same as for No Action in Jones Creek.

5.2.5.10.11.3. Effects of Plan BW-P2. Minimal impact to community cohesion as flood protection is improved with very little environmental change.

5.2.5.10.11.4. Effects of Plan BW-P4. Similar impacts to Plan BW-P2.

5.3. CUMULATIVE IMPACTS.

Population growth of the parish has slowed in recent years as compared to the rapid growth of the 1950's through early 1980's with the decline of the oil industry. A growth rate of 0.6 percent is projected to occur between 1986 and 2047. Development involving the clearing of wooded lands under the future without project condition will result in little changes in the older parts of Baton Rouge simply because there is little left to develop. Development of the northern area will likely continue to be slow, but development of the southern portion, however, will result in the rapid conversion of wooded and agricultural lands to residential and commercial use because the demand for land is so great. The past and projected conversion of wooded land to urban uses within the total parish, and the different portions, is reflected in Table 5-2-1-2-1. The city/parish has developed what is called The Horizon Plan to assist in planned growth and development. The Horizon Plan incorporates numerous concepts, one of which is drainage, and was adopted by the city/parish council in 1992.

The total of 280 acres of wooded land converted to flood control channels by the sum of the Recommended Plans for each of the watersheds described in this report would be a part of the total, but would consist of a minimal portion of the total wooded land converted in the parish during the time of construction. However, the conversion of approximately 397 acres of cleared land to wooded land as proposed by the habitat mitigation plan would actually result in a net increase, as a result of the proposed action, in the total amount of wooded land in the parish. Various flood control activities planned by the city/parish but awaiting funding would be additive to, but not part of, the proposed action. These actions consist of replacements of culverts or bridges, additional clearing and snagging or enlargement of channels, and similar activities. Some adverse impacts would accrue to the aquatic and terrestrial resources including wetland functions as a result of these actions in the process of achieving positive social and economic impacts.

6. LIST OF PREPARERS

The following people were primarily responsible for preparing this statement.

NAME	DISCIPLINE EXPERTISE	EXPERIENCE	ROLE IN EIS
Mr. William Wilson	Wildlife Biology	6 Yrs, Wildlife Biol., Georgia DNR; 16 Yrs, Biologist, NOD	EIS Coordinator; Effects on Agri lands, BLH forests, T&E species, Aquatic Resources (Ecol.), Noise, Vectors
Mr. Francis Vicidomina	Civil Engineer	15 Yrs, Civil Engineering, NOD	Study Manager
Mr. Timothy Lookingbill	Economics	29 Yrs, Regional Economist, NOD	Project Benefits, Effects on Socioeconomics
Mr. Stephen Finnegan	Aesthetics Recreation	17 Yrs, Landscape Architect, NOD	Effects on Aesthetics, Recreation
Mr. James Wojtala	Archeology	17 Yrs, Archeologist, 3 Yrs NOD	Effects on Cultural Resources
Mr. Bill Hicks	Hydraulic / Environmental Engineer	6 Yrs Civil, 2 Yrs Environmental Engineering, NOD	Effects on Aquatic Resources (Water Quality), Water Quality Section of Engnrng Appendix
Ms. Cheryl G. Peyton, P.E.	Hydraulic Engineer	4 Yrs Civil, 4 Yrs Environmental Engineer, 2 Yrs NOD	HTRW Appendix
Ms. Julie Z. LeBlanc, P.E.	Hydraulic Engineer	3 Yrs Civil, Priv. Indus; 2 Yrs Hyrdraulic Engnr, NOD	404(b)(1) (Physical features); HTRW Appendix
Mr. Falcolm Hull	Civil Engineer	21 Yrs, Civil Engineering; Study Mngr, NOD	Study Supervision Land Use Appendix
Mr. Nicholas Constan	Economist	24 Yrs, Regional Economist, NOD	Overall Economic Review
Mr. David Carney	Wildlife Biology	1 Yr, Biologist, USFWS; 17 Yrs, Biologist, NED & NOD	Overall Environmental Review

7. PUBLIC INVOLVEMENT, REVIEW, AND CONSULTATION

7.1. PUBLIC INVOLVEMENT PROGRAM

The initial public meeting was held October 30, 1984, in Baton Rouge, Louisiana, to allow the public to comment on the plans developed in the Initial Evaluation Report. Scoping for this EIS was begun with the mailing of a scoping input request dated March 4, 1988 to all on the mailing list for the project. Major concerns resulting from that mailing including prompt implementation of flood control measures, alternatives, fish and wildlife habitat protection, and non-structural alternatives. Letters received from the following agencies or individuals were as follows: from Federal agencies - four; from local government - two; from local business - one; from environmental groups - one; and from private citizens - five. Between 1988 and 1993 meetings have been held with environmental groups, Federal and state government, and with local City/Parish government. Close coordination has been maintained with the Amite River Basin Drainage and Water Conservation District (ARBWCD). Corps of Engineers personnel have attended their meetings. Corps personnel have met with local mayors, state legislators, Baton Rouge Chamber of Commerce, East Baton Rouge City/Parish Department of Public Works, Louisiana Department of Wildlife and Fisheries, Louisiana Department of Environmental Quality, Louisiana Department of Transportation and Development, and Louisiana Department of Agriculture and Forestry. The Notice of Availability of the Draft EIS was documented in the Federal Register of February 24, 1995. The review period ended on April 14, 1995. For a more complete discussion of the public involvement program, see the Section entitled Summary of Coordination, Public Views, and Comments within the Feasibility Report.

7.2. REQUIRED COORDINATION / COMPLIANCE

7.2.1. General. As indicated in the previous paragraph, close coordination has been maintained with several local, state, and Federal agencies. Major statutes for which compliance has been achieved or will be achieved are included in the following paragraphs.

7.2.2. National Environmental Policy Act. The following activities have been or are in the process of being accomplished: filing of a notice of intent in the Federal Register on February 12, 1988; scoping as indicated Paragraph 7.1 above; publishing a Draft Environmental Impact Statement (EIS) and incorporation of comments from public review including a public meeting into this Final EIS; publishing of the Final EIS and allowing public review; and, finally, preparation and signing of a Record of Decision.

7.2.3. Clean Air Act. Review of this statement by the Environmental Protection Agency achieves compliance.

7.2.4. Clean Water Act. A 404(b)(1) Evaluation has been prepared for the portions of each of the watersheds in which materials will be deposited into waters of the United States. Project compliance with 404(r) requirements has been achieved, however, the District chose to pursue State Water Quality Certification, instead. State Water Quality Certification, dated May 15, 1995, was granted by the Louisiana Department of Environmental Quality for the Recommended Plans as described in this report.

7.2.5. Coastal Zone Management Act. East Baton Rouge Parish is not in the coastal zone. A letter was sent to the Coordinator of the Louisiana Coastal Resources Program with the determination that the proposed action for each watershed would be consistent, to the maximum extent practicable, with the Coastal Resources Program of the State of Louisiana. No critical letter nor telephone call was received in the 45-day review period. A copy of the letter sent is included in Appendix E, Section 9.

7.2.6. National Historic Preservation Act. Preliminary cultural resources investigations have been coordinated with the State Historic Preservation Office (SHPO). Plans to conduct additional investigations are being coordinated with the SHPO. All necessary cultural resources studies and coordination will be completed prior to construction. A record of pertinent correspondence is included in Appendix G.

7.2.7. Fish and Wildlife Coordination Act. Regular communication has been maintained with the US Fish and Wildlife Service (USFWS) as well as the Louisiana Department of Wildlife and Fisheries. The report of the Secretary of the Interior (from the USFWS) is included in this report. Recommendations and the District responses are included in paragraph 7.5.

7.2.8. Endangered Species Act. Correspondence was initiated with all agencies responsible for administering the Act. Copies of the correspondence and any pertinent follow-up correspondence ares included in Section 4 of Appendix E. Comments regarding threatened and endangered spedies are included in the Fish and Wildlife Coordination Act Report. Additionally, one specific section of this EIS addresses the concerns of this statute.

7.2.9. Farmland Protection Policy Act. A request was made to the representative of the Soil Conservation Service regarding compliance with this statute. A copy of the rating form for the features of the project affecting land zoned as farmland is included in Section 6 of Appendix E.

7.2.10. Executive Order 11988, Floodplain Management. This order deals with minimizing or avoiding impacts associated with the base floodplain unless there is no practicable alternative. Public notice of possible Federal actions to be recommended within the floodplain was made at the public meeting of October 30, 1984, within the

Notice of Intent to prepare an EIS, in the scoping packet mailed to interested individuals, and in this statement.

7.2.11. Executive Order 11990, Protection of Wetlands. This order was considered in planning. The decision to haul the dredged material to a landfill in three of the watersheds was based, in part, upon this order.

7.3. STATEMENT RECIPIENTS.

Copies of the draft EIS were mailed to those listed in Section 8 of Appendix E.

7.4. PUBLIC VIEWS AND RESPONSES

7.4.1. General. The views expressed during the scoping period were considered in the planning process. Significant flood events of 1953, 1962, 1973, 1977, 1979, 1983, 1989, 1990, and 1993 resulted in significant public concern for corrective flood control action to be taken. Meetings with environmental groups revealed their concern for aesthetics and green areas within the urban area.

Comments on the draft EIS were generally supportive of flood control actions. A public meeting on the study was held at the East Baton Rouge City/Parish Council Chambers on March 21, 1995. Approximately 70 persons attended. Most of those in attendence were in support of the flood control actions. Some victims of past flooding expressed concern that implementing any sort of remedial action was taking so long. The opposition was in regard to the Bayou Fountain watershed work plan and fear of the effects of additional flows overtopping the levee on the south bank of Bayou Manchac. This concern was voiced by the Pontchartrain Levee Board, representatives of the two correctional institutes in Iberville Parish, representatives of Ascension Parish government, and a citizen of the Spanish Lake area of Iberville and Ascension Parish. The concern and the response, including an explanation, is included in Appendix L, Public Involvement.

7.4.2. Comments to the Draft EIS. Letters of comment to the Draft EIS were received from the following agencies, businesses, or individuals. Responses to the letters are included in Appendix L.

- U.S. Environmental Protection Agency
- Federal Emergency Management Agency
- U.S. Department of the Interior
- U.S. Department of Commerce
  - Coast and Geodetic Survey
  - National Marine Fisheries Service

- U.S. Department of Transportation, Federal Highway Administration
- U.S. Department of Health and Human Services, Public Health Service
- Louisiana Department of Environmental Quality

7.5. U.S. FISH AND WILDLIFE SERVICE (USFWS) RECOMMENDATIONS

The recommendations made by the USFWS in the Coordination Act Report are listed along with the Corps of Engineers responses.

1. To the extent feasible, flood control measures in Blackwater and Beaver Bayous, particularly in the lower reaches, should be limited to minimal clearing and snagging activities.

Response: The Recommended Plan proposed for Blackwater Bayou includes minimal modification from the mouth of the bayou at the Comite River upstream to Hooper Road. The Recommended Plan proposed for Beaver Bayou includes no channel modification from the Comite River upstream to Frenchtown Road.

2. Where sufficient space is available, channel rights-of-way impacted by channel enlargement should be revegetated immediately after construction is completed.

Response: The aesthetic mitigation plan will include, where space is available, the planting of hardwood trees and shrubs on Jones Creek, Ward Creek, and Bayou Fountain, and trees only on Beaver and Blackwater Bayous. This would be in addition to any habitat mitigation. Channel slopes would be planted with grass seed to establish a turf immediately after construction is completed.

3. Project impacts to fish and wildlife resources should be mitigated by either a) purchasing and implementing timber stand improvement measures on 319 acres of land adjacent to Bayou Duplantier, from the Stanford Avenue crossing to its confluence with Dawson Creek; or b) purchasing and reforesting 436 acres of open land, in one parcel or scattered tracts, located adjacent to land(s) currently owned by the Baton Rouge Recreation and Park Commission. These lands should be located within floodplain areas with hydrology similar to that of the project channels.

Response: Currently the recommended mitigation plan, which is the product of an attempt to develop consensus of the Corps and Service's evaluation and compensation output, would include acquisition of 397 acres of land, 115 of which would be adjacent to one of the BREC parks, with the 282-acre residual area currently to be off Joor Road in the northern portion of the parish. We should not restrict the local sponsor to these two specific tracts, however, if other suitable sites become available at less costs. We concur

with the concept that mitigation may be more cost effective to riparian species on sites adjacent to streams; however, this is based upon the assumption that land would be available and would be relatively inexpensive when actually it may not be inexpensive because of high acquisition and severance costs when dealing with numerous property owners. We do not recommend the acquisition of the tract of land adjacent to Bayou Duplantier because of high real estate costs.

4. Maintenance work conducted on impacted streams should be limited to instream clearing and snagging with hand-held equipment.

Response: The future conditions without any Federal action includes maintenance work consisting of regular herbicide applications to control instream tree growth and to produce channel banks lined with bermudagrass. This is currently being done on some basins and is planned for all basins. It would continue with implementation of any alternative. With any alternative in place, operation and maintenance would involve as-needed removal of large obstructions. Periodic selective clearing and snagging, i.e., maximizing the use of hand-held equipment, would be utilized to maintain the channels.

5. Prior to initiating any construction activities, the Fish and Wildlife Service (Service) should be consulted regarding threatened and endangered species, particularly the bald eagle, as there is a currently inactive nest in the vicinity of the work area.

Response: Concur.

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