

FINAL

Environmental Impact Statement

ST. JOHNS BAYOU and

**NEW MADRID FLOODWAY,
MISSOURI**

**DEPARTMENT OF THE ARMY
MEMPHIS DISTRICT, CORPS OF ENGINEERS
MEMPHIS, TENNESSEE
MAY 1975**



SUMMARY

St. Johns Bayou and New Madrid Floodway Project,
Missouri

() Draft (X) Final Environmental Statement

Responsible Office. U. S. Army Engineer District, Memphis,
Tennessee

1. Name of Action. () Administrative (X) Legislative

2. Description of Action. The recommended plan provides flood control and drainage to urban and rural areas and mitigates both quantifiable and intangible losses to fish, wildlife and other environmental resources which will result from project construction. Features of the project consist of constructing a 2,000 cfs pumping station in conjunction with 64.2 miles of channel enlargement in the St. Johns Bayou area; channel clean-out on 5.8 miles of streams in the city of Sikeston; construction of a 500 cfs pumping station in the lower New Madrid Floodway; construction of a 500 cfs pumping station, an outlet structure with an opening of 200 square feet controlled by two power operated lift gates, channel improvement on 11.0 miles of streams, and construction of 4.0 miles of new channel in the St. James Bayou area of the New Madrid Floodway; purchase of approximately 2,500 acres in Tenmile Pond with appropriate water control structures for fish and wildlife management, easements to permit annual flooding on some 4,900 acres of lowlands for waterfowl management, public access for hunting and fishing along berms and spoilbanks of enlarged channels, and public fishing access to existing borrow areas.

3. a. Environmental Impacts. The project area presently contains an estimated 9,300 acres of woodlands, some 95 percent of the two basins having been converted to agricultural production. An estimated additional 7,200 acres of woodlands are expected to be cleared as direct and indirect consequences of project construction. A total of 81 miles of existing ditches will be enlarged by excavating from one side. Four miles of new channel will be constructed. Existing bank vegetation will be left undisturbed along one side of the enlarged ditches and excavated spoil will be permitted to revegetate naturally. Aquatic resources will be permanently degraded in the altered ditches although these impacts will

Soil Conservation Service, USDA
Forest Service, USDA
Department of Housing and Urban Development
Department of Transportation
Department of Health, Education, and Welfare
Advisory Council on Historic Preservation
Office of Economic Opportunity
Bootheel Regional Planning Commission and Economic
Development Council
Missouri Department of Community Affairs (Missouri
Clearinghouse)
Missouri Department of Conservation
Missouri State Highway Commission
Missouri State Park Board
Missouri Water Resources Board
Sport Fishing Institute

b. Comments Received (Departmental Review)

Environmental Protection Agency
Department of Interior
Department of Agriculture
Department of Transportation
Regional Representative of the Secretary
United States Coast Guard
Department of Health, Education, and Welfare
Governor of Missouri
Missouri Department of Natural Resources

6. Revised Draft Statement to CEQ 7 February 1975.
Final Statement to CEQ JUN 2 1976.

TABLE OF CONTENTS

<u>Para</u>	<u>Subject</u>	<u>Page</u>
1	Project Description	1
2	Environmental Setting	2
3	Environmental Impacts of the Proposed Action	17
4	Adverse Environmental Effects Which Cannot be Avoided Should the Proposal be Implemented	29
5	Alternatives to the Proposed Action	32
6	The Relationship between Local Short-Term Use of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity	43
7	Any Irreversible and Irretrievable Commitments of Resources Which Would be Involved in the Proposed Action Should It be Implemented	44
8	Coordination with Others	45

Photographs

<u>Photograph No.</u>	<u>Subject</u>	
1	Birds Point-New Madrid Floodway Area	Photographs Follow Page 16 of Text
2	St. Johns Bayou Area	
3	Birds Point-New Madrid Floodway Area	
4	New Madrid, Missouri	

Tables

<u>Table No.</u>	<u>Subject</u>	<u>Page</u>
I	Annual Values of Hunting, Fishing, and Trapping Resources Lost to the Project and Replaced by Mitigation	26
II	Summary of Fishing, Hunting, and Trapping Values	37

ST. JOHNS BAYOU AND NEW MADRID FLOODWAY, MISSOURI
ENVIRONMENTAL IMPACT STATEMENT

1. PROJECT DESCRIPTION

The St. Johns Bayou and New Madrid Floodway basins are located in southeast Missouri and include all or portions of New Madrid, Scott, and Mississippi Counties. The basins are adjacent to the Mississippi River, extending from the vicinity of Commerce, Missouri, to New Madrid, Missouri. The two areas are separated by the Birds Point - New Madrid Setback Levee. The study of this project by the Secretary of the Army was authorized by resolutions adopted 9 April 1965 and 2 February 1966 by the Committee on Public Works of the United States Senate which requested the review of the report on the New Madrid Floodway, Missouri, published as House Document Numbered 183, 83rd Congress, and the report on the Mississippi River and Tributaries Project, published as House Document Numbered 308, 88th Congress. Purposes of the project are (1) reduction of the frequency and duration of flooding and if the project is implemented (2) the preservation of as much fish and wildlife resources as is feasible. The recommended plan is responsive to regional and national concern for fish, wildlife, and waterfowl preservation while satisfying local needs for flood control. Of all plans considered, the recommended plan provides the maximum excess of benefits over costs. It consists of construction of 2,000 cfs pumping station in conjunction with 64.2 miles of channel improvement in the St. Johns Bayou area; channel cleanout on 5.8 miles of streams in Sikeston, Missouri; construction of a 500-cfs pumping station in the lower New Madrid Floodway; construction of a 500-cfs pumping station, an outlet structure with an opening of 200 square feet, and channel improvement on approximately 11.0 miles of streams and construction of 4.0 miles of new channel in the St. James Bayou area of the New Madrid Floodway; and purchase of approximately 2,500 acres in Tenmile Pond for fish and wildlife management, construction of appropriate water control structures in Tenmile Pond, easements to permit annual flooding on lowlands, and access for fishing in borrow areas to mitigate fish and wildlife losses which are expected to occur as a result of the proposed project. The St. Johns Bayou and New Madrid Floodway project is currently in the preauthorization study phase. The location and extent of proposed developments are shown on Plates 2 and 3. The benefit-cost ratio of this proposed project is presently 2.2 to 1, using an interest rate of 6-7/8 percent and a 100 year evaluation period.

2. ENVIRONMENTAL SETTING

2.01 BASIN DESCRIPTION

The 685 square-mile study area is located adjacent to the Mississippi River in New Madrid, Scott, and Mississippi Counties, Missouri as shown on Plate 1. Forming a part of the west bank flood plain of the Mississippi River, it is substantially devoid of relief with elevations ranging from 280 to 325 feet above mean sea level.

Prior to settlement, the entire area was densely forested. It now contains some of the most productive agricultural land in the nation as a result of flood protection provided by Mississippi River levees. Woodland clearing has progressed until more than 95 percent of the original hardwood forest has been removed, primarily for row crop production which consists mostly of soybeans and cotton. Drainage of the area is provided by a series of north-south parallel ditches which empty into the Mississippi River immediately east of the city of New Madrid. The St. Johns Bayou area covers 480 square miles lying east of Sikeston Ridge. The New Madrid Floodway portion is comprised of 205 square miles which are separated from the St. Johns Bayou area by a setback levee. It is entirely enclosed by Mississippi River project levees except at the lower end where a 1,500-foot gap provides an outlet for interior drainage.

2.02 PHYSICAL SETTING

2.021 Hydrology. Studies made by the Missouri Water Resources Board in 1966 showed surface water areas of 370 acres in Mississippi County, 177 acres in New Madrid County, and 5,784 acres in Scott County.

The largest lake in the study area is an artificial impoundment of 22 acres in Big Oak Tree State Park. The only other bodies of water of any size are Tenmile Pond and the 10-acre 34 Corner Blue Hole managed as a fishing lake by the Missouri Department of Conservation. Major water courses consist of St. Johns Bayou, North Cut Ditch, Ash Slough Ditch, Main Ditch, Wolf Hole Lateral, Birds Point-New Madrid Levee Ditch, and St. James Bayou. Portions of the Birds Point-New Madrid Levee Ditch and the East Bayou Ditch are borrow pit ditches that were constructed or enlarged during construction of the levees. All of the other channels have been previously channelized for drainage purposes.

soils are poorly drained but due to the silty overwash material they dry out in the surface somewhat sooner than the heavier textured soils of unit 1. They respond well to drainage and, when drained, are moderately productive.

The "New Madrid Fault" is the most notable geologic structure associated with the study area. The fault, which has been described as an underground crack in the earth's structure, became prominent to the general public following a major earthquake in December of 1811. The record goes back as far as 1776 when a shock of moderate intensity occurred. The fault is actually an unstable area far below the surface of the earth, and therefore, is completely invisible. It is generally believed that the fault extends from about Cairo, Illinois, to the vicinity of Memphis, Tennessee. The quake in 1811 was followed by two others in early 1812, all of which registered 12 on the Richter Scale and which researchers say were the most violent earth tremors ever on the North American continent. This series of major disturbances has since been referred to by geologists as "The New Madrid Earthquake." The area most affected was sparsely settled at the time of occurrence, and because of this damage to property and loss of life was relatively light. One of the most notable results of the tremor was the lowering of a 30-square-mile area in West Tennessee forming Reelfoot Lake. Since 1812, there have been many minor quakes in the area; and statistical studies indicate that additional earthquakes can be expected because energy builds up over periods of time in fault areas, and then it is released over a short period of time causing a tremor.

Immediately adjacent to the study area is the Mississippi River which serves the largest drainage area in the contiguous United States and is one of its most significant natural resources. The Mississippi within this reach is classified as an alluvial river, so characterized by its continually changing sinuous course that develops by flowing in erodible alluvial sediments. The meandering of an alluvial river results primarily from local bank erosion and consequent local overloading and deposition by the river of the heavier sediments which move along the bed. This meandering is essentially a natural trading process of sediments from banks to form sand bars. The rate of trading, or forming of sand bars, depends upon the rate of bank caving. For centuries,

There are presently an estimated 9,300 acres of woodland remaining in the study area of which approximately 800 acres are located along banks and spoil areas of drainage ditches. The woodlands are comparatively uniform in stocking and growth rates with red, white, and other oaks, cypress, sweet gum, ash, and hickory as the predominant species. Cypress dominate the lowest area.

2.032 Zoological Elements. Big Oak Tree State Park and the Tenmile Pond area contain the largest tracts of bottomland forest habitat remaining in the project area. These areas, scattered woodlots, and narrow strips of woodlands along streambanks provide cover for a variety of birds, mammals, and other wildlife.

The study area lies directly in the Mississippi River flight line traversed by the bulk of the flyway waterfowl population. The loss of essentially all woodlands has made those remaining particularly significant to waterfowl since bottomland forests are an excellent source of waterfowl food when flooded. Such areas are heavily used by migrating and wintering waterfowl because overflow periods usually coincide with the seasonal movement of ducks. Some waterfowl hunting is available with several relatively small forested and rice field areas being leased to duck-hunting clubs. Hunting provided by ducks within the study area is not a fair measure of the value of the remaining overflow-woodland habitat since waterfowl use of these lands is not limited to the hunting season. Essential food and resting areas for migrating waterfowl are provided by these lands whenever their movement coincides with overflow. Thus, the remaining woodlands are of significance to agencies at both state and national levels having waterfowl management responsibilities.

Forested areas provide squirrel hunting opportunities. Where good cover conditions exist along fence rows, channel banks, and in wooded areas, good populations of bobwhite quail, rabbits, raccoon and possum are present.

Surveys conducted prior to 1966 by the Missouri Department of Conservation indicated that the rabbit and quail populations were fair to good. Quail had an estimated population of one bird per 4.5 acres or 1-1/2 coveys per 100 acres and rabbits had an estimated density of 25 per 100 acres.

as rare or endangered in various states. The Missouri Department of Conservation advises that the following fish species listed as rare or endangered in Missouri may be present in the project area: alligator gar (rare), pallid shinner (possibly extirpated), pugnose minnow (endangered), brown bullhead (rare), golden top minnow (possibly extirpated), and bantam sunfish (rare). Although the above were not classified as rare or endangered in "Threatened Wildlife of the United States" Resource Publication 114, Department of the Interior, dated March 1973, the classification indicated is appropriate for the state of Missouri.

The Missouri Department of Conservation advises that there may be in the project area the following wildlife species which are considered to be of rare, endangered, or of undetermined status in Missouri: south-eastern shrew (rare), eastern big-eared bat (endangered), longtailed weasel (rare), spotted skunk (undetermined), sharp-shinned hawk (endangered), Cooper's hawk (endangered), red-shouldered hawk (rare), northern bald eagle (rare), American osprey (endangered), peregrine falcon (endangered), Mississippi kite (rare), king rail (rare), barn owl (rare), fish crow (rare), Swainson's warbler (rare), pigeon hawk (undetermined), wood ibis (undetermined), Virginia rail (undetermined), purple gallinule (undetermined), common gallinule (undetermined), hooded warbler (undetermined), wood frog (possibly extirpated), Illinois chorus frog (undetermined), eastern spadefoot toad (undetermined), mole salamander (undetermined), three-toed amphiuma or three-toed Congo eel (undetermined), alligator snapping turtle (rare), green water snake (rare), and scarlet snake (rare). The peregrine falcon is the only one of the above species included in "Threatened Wildlife of the United States."

2.04 SOCIAL SETTING

2.041 Noise. The greatest source of noise is from traffic along Interstate 55 which traverses the western edge of the study area. Interstate 57 crosses the northern portion of the area. The city of New Madrid is subject to the sounds of towboats and other traffic on the Mississippi River. The entire area is subject to the noise of aircraft from nearby Blytheville Air Force Base in Arkansas which frequently fly over the area at low altitudes. Agricultural activity does produce some noise as a result of operating farm equipment. None of these are considered serious noise problems. The general noise level is, for the most part, typical of relatively isolated rural areas.

However, certain parts of it were settled and populated earlier than north Missouri. New Madrid was settled in 1789; Cape Girardeau in 1793. El Camino Real (King's Highway) served as a connecting link between the four major Colonial settlements of St. Louis, St. Genevieve, Cape Girardeau, and New Madrid. On the other hand, the region is rich in archeological history. It contains the major surviving evidence of Mississippian Temple Mounds in Missouri, several of which are protected by the Historic Preservation Act of 1966 (PL 89-665). Included in the National Register of Historic Places are the following archeological and historical sites: Swank, Jacob, House; Missouri Pacific Depot at Charleston; Crosno Fortified Village Archeological Site; Towosahgy State Park and Archeological Site (Beckwith's Fort); Sandy Woods Settlement; E. L. Brown Village and Mound Archeological Site; Mound Cemetery (Lilbourn Fortified Village Archeological Site); Hoecake Village Archeological Site; O'Bryan Ridge Archeological District; Hearnest Site; Hurricane Ridge Site; Sikeston Fortified Village Archeological Site; Hess Archeological Site; Mueller Archeological Site; and LaPlant Archeological Site. The following sites are being prepared for nomination to the National Register of Historic Places: King Archeological Site, St. John's Archeological Site, and New Madrid Historical District. In addition to these major archeological sites, the project has numerous minor and unexplored sites.

2.047 Recreational and Leisure Opportunities. The proposed project is within the six-county area encompassed by the Bootheel Regional Planning Commission. According to both the Commission and the Missouri Outdoor Recreation Plan, Volume I, 1970, the region is confronted with a deficiency in all types of outdoor recreational opportunities. The state plan contains the following statements:

"Due to the richness of the soil and high land values, little provision has been made for large scale recreation. There is some fishing and great dove hunting, but there is limited habitat for game fish and animals.

The land uses prevalent in the bootheel have removed most of the recreation potential in that area. Tennile Pond in Mississippi County and limited areas of hardwood timber along the St. Francis River constitute the remaining natural environment of the area. However, these features are threatened daily by clearing and draining of lands for agricultural purposes, and therefore, public acquisition of swampy timber lands in Southeast Missouri should be placed high on the priority list."

and flood related expenses, including repair of streets, sewers and other facilities vital to community functions. Many consequences of flooding cannot be evaluated in monetary terms, but these intangible losses and the detrimental effects on personal well-being are significant. Measurable losses to the city of Sikeston currently average approximately \$38,000 annually.

2.06 FUTURE ENVIRONMENT WITHOUT THE PROJECT

2.061 Aquatic Resources.

a. Water. There will be some disturbance of ditch bank vegetation as local interest continue to improve channels in the future. The reduction in soil-holding vegetation will inevitably contribute to suspended solids in the form of soils washing into the streams. Reduction in overall extent of absorbent buffer zones will contribute to the amounts of herbicides and nutrient phosphorous and nitrogen which enter the water. The cities of New Madrid, Sikeston, Charleston, and East Prairie are dependent upon existing channels to carry an ever-increasing volume of surface water, storm sewage, and effluent from their respective sewage treatment plants.

b. Waterfowl. The future impact of basin developments upon migratory waterfowl will not be significant since the bulk of former waterfowl wintering habitat is largely depleted, but trends will continue downward. Improved maintenance of ditches by local interests will reduce duration and extent of stream overflow and result in some further decline of natural habitat. Reduction in winter flooding will have a significant adverse impact on waterfowl distribution.

c. Fish, Sport and Commercial. Local interest will continue to improve drainage and reduce flood threats by enlarging and maintaining the existing ditch systems. This will result in some reduction in the quality and amount of sport fishing due to an increase in water turbidity and sediment loads. In the study area commercial fishing is legal only in the Mississippi River. Anticipated future trends in the study areas will, therefore, have no impact upon commercial fishing.

d. Aquatic Ecosystems. Impacts upon water quality as outlined in the previous paragraph will result in some reduction in the species diversity of benthic and other aquatic invertebrates. This in turn will be adversely reflected to some extent upon numbers and composition of game and other fish species.

c. Community Cohesion. The common concern of rural and urban populations for flood prevention and adequate drainage outlets will tend to increase community cohesion.

d. Displacement of People. Lands presently being farmed in areas subject to annual crop losses due to flooding or inadequate drainage may result in displacement of the involved landowners for financial reasons. Also, residents of low-lying urban areas may eventually be forced to move if flooding of homes becomes frequent or severe as a result of inadequate surface drainage.

e. Desirable Community Growth. More than 95 percent of the study area is in agricultural production. Thus, there is practically no opportunity for an increase in rural growth. On the contrary, in keeping with projected regional and national trends, it must be realistically acknowledged that rural populations will continue to decline as agricultural mechanization continues to replace the rural labor market and the numbers of small farm units decrease. Small urban communities on the other hand offer a potential for growth, with the desirable effect of attracting people who might otherwise contribute to the "ballooning" influx of major metropolitan areas already overburdened by numerous and growing social problems. The location of the cities of New Madrid (population 2,719), Sikeston (population 14,699), East Prairie (population 3,275), and Charleston (population 5,131) with respect to major transportation arteries and the major market areas of St. Louis and Memphis make these ideal sites for small manufacturing and processing plants. Constraints to such growth revolve largely around problems of inadequate drainage, sewage disposal, control of water pollution, and the disposal of increasing amounts of storm water. These are particularly cogent factors in view of the fact that all of these towns lost population during the last decade except Sikeston, and its rate of increase was less than one-half the national average.

f. Archeological and Historical Elements. Interest in the early human history of the study area will increase with the continued protection, exploration and development of prehistoric Indian settlements for educational and cultural purposes. All significant archeological sites will be identified and protected by law. Most will be acquired in fee with either public or private funds. Modern historical interest will increase with local promotion of New Madrid as the earliest American settlement

transportation activities. Industrial expansion and urban development will be limited because of this and monies which could be used to entice development and expansion would necessarily be diverted to offset repair of public works and facilities damaged by flooding.

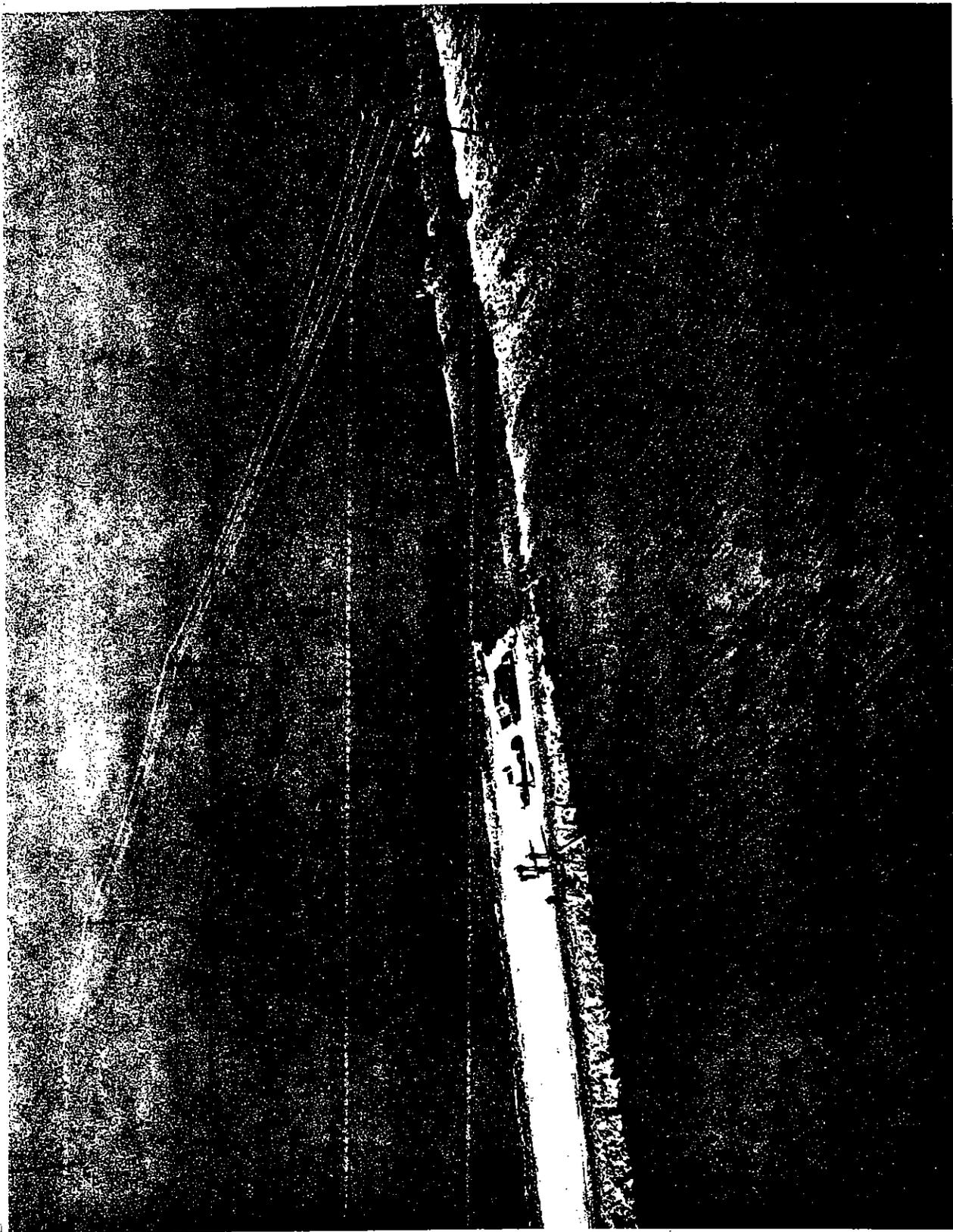


Photo 1 - 18 March 1973 Flood - Birds Point - New Madrid Floodway area.
Non-crop flood damages resulting from flooding of roads. Note
extent of flooding.

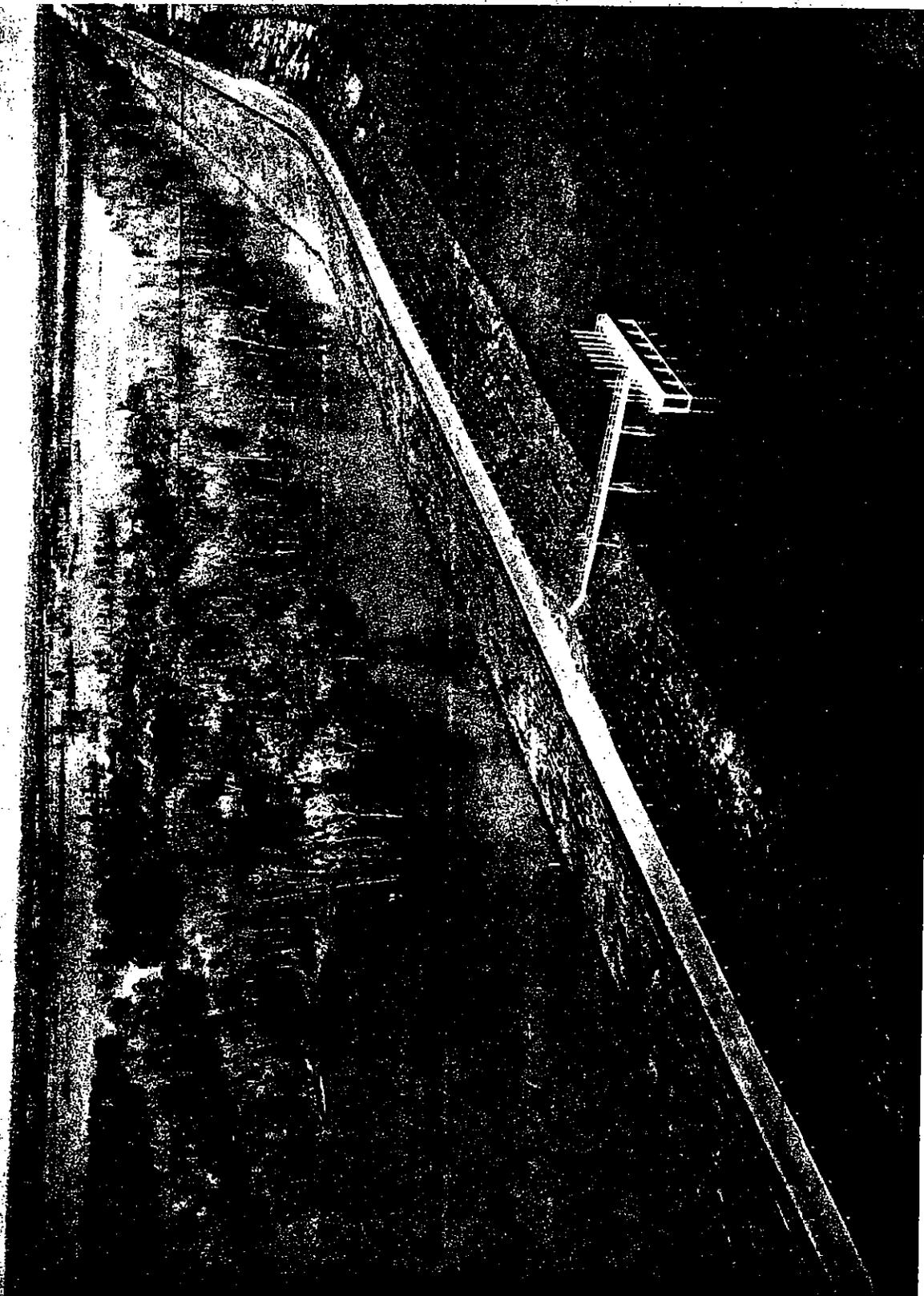


Photo 2 - 5 April 1973 Flood - St. Johns Bayou area. Note St. Johns Bayou outlet structure in foreground, (gates closed). Flooding occurs in the St. Johns Bayou area as a result of accumulation of interior runoff when stages of the Mississippi River do not permit gravity drainage.

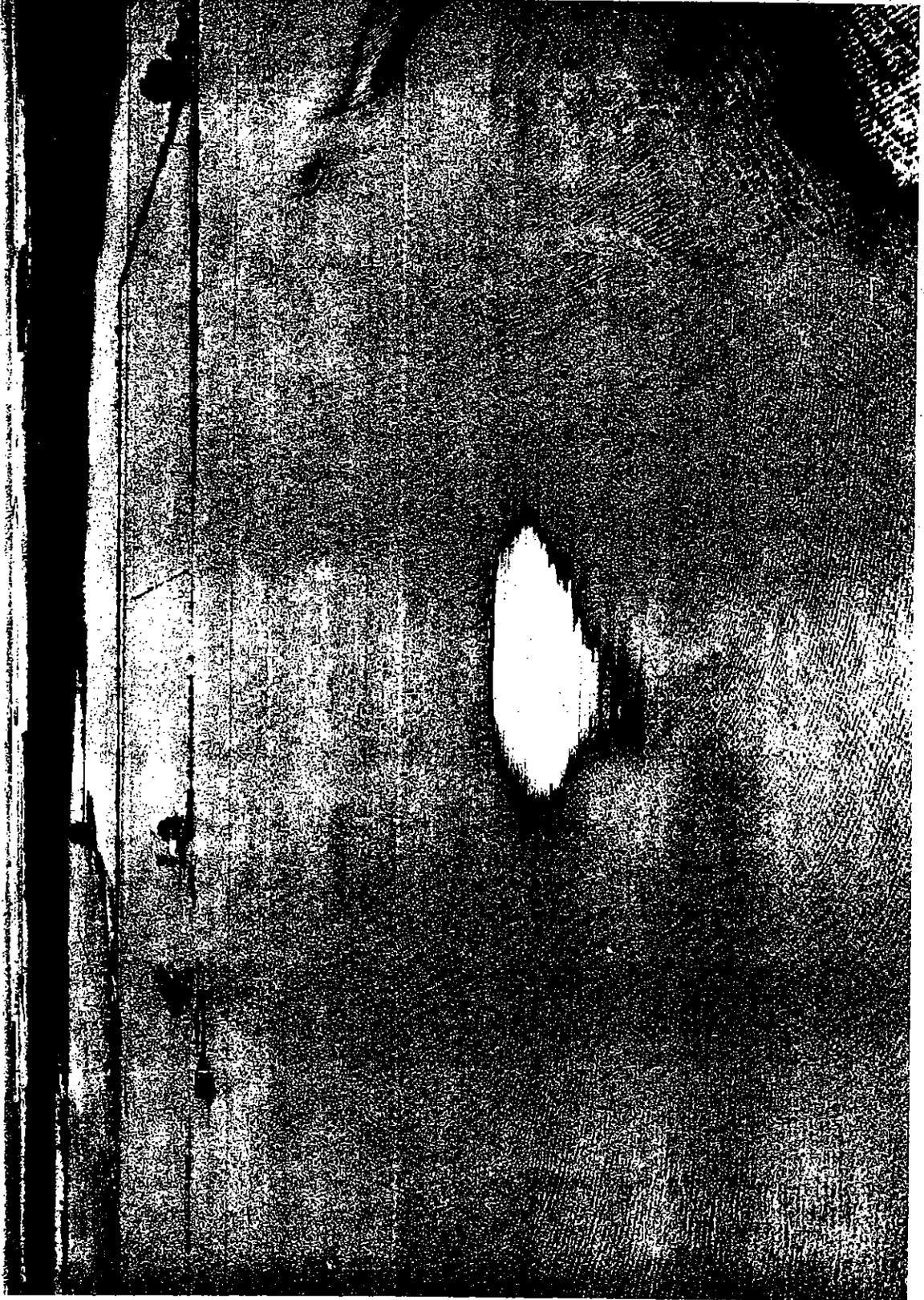


Photo 3 - 29 April 1973 Flood - Birds Point - New Madrid Floodway area.
The photograph shows the extent of flooding on cultivated
lands lying in the floodway.



Photo 4 - 26 April 1973 Flood - New Madrid, Missouri, area. Note school bus in background.

3. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.01 PHYSICAL IMPACTS (Without Mitigation)

3.011 Construction Impacts.

a. St. Johns Bayou Area. A 2,000 cubic feet per second pumping station will be constructed adjacent to the existing outlet structure approximately 0.7 mile east of New Madrid, Missouri. Channels will be enlarged on 64.2 miles of existing ditches to provide a three-year level of flood protection. Dimensions of the enlarged channels will vary by reach and tributary. Ditches will not be significantly deepened, with three feet being the greatest increase in depth. Existing widths, however, will be approximately doubled. Ditches now varying from 10 to 70 feet in width will range from 15 to 120 feet wide. All channelization work will be accomplished from one side wherever feasible to minimize environmental degradation. Channels will be constructed with 1 on 2.5 side slopes to minimize sloughing and erosion. Spoil from the channel enlargement will be left in rough condition as requested by the fish and wildlife management agencies to permit a diversity of plant regrowth and wildlife habitat. In addition to the rural channel enlargements, 5.8 miles of stream within the city of Sikeston, Missouri, will be cleaned out to permit uninterrupted flows to their intended capacities.

b. New Madrid Floodway Area. A floodgate and levee closure are currently authorized to prevent backwater flooding of the lower portion of the floodway during high stages of the Mississippi River. Water now enters the floodway through a 1,500 foot opening between the Mississippi River main line levee and the Birds Point-New Madrid Setback Levee. Local interests have requested that construction of these features be deferred until a pumping station is authorized for construction in conjunction with the levee closure and outlet structure. The recommended plan calls for construction of a 500-cubic feet per second pumping station at this site to evacuate floodwaters caused by accumulation of interior headwater and seepage.

Implementation of the recommended plan will result in hydrologically separating the St. James Bayou drainage area from the lower portion of the New Madrid Floodway. The proposal for the St. James Bayou area includes a pumping station with a capacity to pump 500 cubic feet per second,

a. Botanical Resources. The project will indirectly result in an estimated 7,000 acres of woodlands being cleared and put into agricultural production. In addition, approximately 400 acres of trees and other vegetation will be removed from the banks along some 81 miles of ditches to facilitate channel enlargement. Approximately 1,550 acres of woodlands and 374 acres of ditch-bank cover will remain in the basin following project completion, or about 21 percent of pre-project woodland acreage. Although the berm along one side of the channels will be kept clear for maintenance purposes, the spoil banks will be permitted to grow back with natural vegetation.

b. Zoological Resources. Game species populations will be reduced commensurate with woodland and ditch-bank cover losses or 79 percent. Although the project will have no significant impact on big game hunting (a sport no longer available in the study area as a result of insignificant deer populations), an annual existing potential of some 900 annual trips of small game hunting will be reduced to about 200 annual hunting trips. A reduction in winter flooding will have an adverse impact upon waterfowl populations and distribution in the project area. Hunting opportunity currently estimated to provide some 4,300 waterfowl hunting trips annually will be reduced to about 800 trips annually as a result of the project.

3.082 Impacts on Aquatic Ecosystems. Water quality and fishery resources will be impaired during and immediately following construction and during periodic maintenance operations as a result of heavier sediment loads and increased erosion caused by channel excavation and removal of debris. More intensive agricultural practices and greater use of pesticides will also adversely affect the aquatic habitat. Removal of streambank shade and cover along one side, instream debris, and other niches which support aquatic life will impair fish productivity. Periodic channel maintenance will further disturb habitat, impair water quality, and tend to prevent recovery of fishery values. Non-game species will also be reduced as a result of the loss of some ditch bank vegetation and a decline in the present water quality. The value of these losses is intangible, involving esthetic appeal of the study area and the stability of its ecosystem. However, no species is expected to be threatened with extirpation as a result of anticipated habitat changes resulting from construction of the project. Fisheries will be further damaged as a result of a reduction in overbank flooding which is generally beneficial to fish production. Sport fishing will be diminished by about half, from an estimated 13,500 to 6,800 fishing trips annually.

3.093 Transportation. Extent, duration, and heights of floods will be lowered sufficiently to prevent flooding of roads which frequently occurs in some areas under present conditions.

3.094 Desirable Community Growth. Availability of additional flood-free space will be conducive to the growth of urban areas. Populations of rural areas will probably not be significantly affected one way or the other by the project.

3.095 Esthetic Effects. The recommended plan will cause the existing woody vegetation to be reduced by 79 percent. Taking into account the small amount of trees and other natural plant life remaining in the study area, this loss will significantly impair the esthetic values. Lands which are set aside for the mitigation of fish, wildlife and intangible environmental losses will guarantee the preservation of esthetic values associated with these areas. Unsightly conditions created by denuding berms and spoil areas along ditches will be relatively short-term aspects of esthetic degradation. Existing vegetation will be preserved along one bank of all re-channelized streams, where possible. Spoil along the opposite side will be allowed to grow back with natural vegetation, thus screening construction impacts. The visual appearance of the ditches themselves will be permanently altered after they are widened. They will not regain the degree of natural appearance that they now have as a result of shallower water and the cleared maintenance berm on one side.

3.096 Health. The project will relieve to a certain extent health hazards associated with flooding of sewers and sewage treatment facilities, and water-borne disease vectors.

3.097 Community Cohesion. There is no known community objection to the project. The plan as currently formulated appears mutually acceptable to traditionally opposed interests of agricultural and environmental groups. The project is expected to contribute to the consolidation of interests of both rural and urban communities. A greater cooperative effort is envisioned on the part of all basin inhabitants as a result of mutually derived benefits which are dependent to a large extent upon their assumption of future project maintenance and management responsibilities.

measures taken to minimize or prevent damage to archeological sites thus revealed. Coordination with the State Historic Preservation Officer will help to determine if any of the revealed sites would be eligible for nomination to the National Register of Historic Places. The potential for damaging sites as a direct result of project construction appears minimal. With the exception of four miles of new channelization to circumvent Tenmile Pond and two miles of channel enlargement on St. James Bayou to provide an outlet riverside of the main line levee on Island No. 7, all other construction work will be limited to the pumping plant sites and the enlargement of existing ditches (all previously channelized). Thus, disturbance of archeological sites would be limited to any which might lie immediately adjacent to these ditches. Since construction is to be limited to one side of the ditches, any existing sites could probably be avoided by switching construction to the opposite side of the channel. An indirect effect of improved drainage will be the induced clearing of woodlands by private landowners for agricultural development. This activity may expose additional sites to vandalism or destruction by land forming operations. Thus, it is important that any such areas be surveyed prior to project construction and that landowners be apprised of the location and significance of any sites which are discovered.

3.11 ECONOMIC IMPACTS (Without Mitigation)

The proposed plan will, during the project life, have some predictable effects on the current economic characteristics of the project area of influence.

Flood damage reduction is possibly the greatest predictable economic impact which will result from construction of the project. The magnitude and frequency of damage from floods in the rural and urban areas would be reduced, affording a benefit estimated at \$1,172,700 annually. Increased utilization of lands resulting from more intense and efficient land use because of construction of the project will create a benefit estimated at \$2,119,300 annually. Advanced bridge replacement and utilization of local unemployed labor will result in benefits from proposed works of improvement amounting to approximately \$195,500 annually.

Increased agricultural productivity may result in increased industrial activity related to handling or processing agricultural products. Regional growth may, therefore, be

two activities will be reduced respectively by an estimated 4,200 and 6,700 annual man-days valued at \$32,000. Annual harvest of fur bearing animals will suffer a loss valued at an estimated \$1,000. Mitigation features will not compensate in-kind for losses to individual activities. Restoration of trapping opportunity will be negligible. The monetary value of hunting, fishing, and pelts lost to the project and replaced by mitigation are displayed in Table I. Individual mitigation measures will provide about 3,000 man-days of hunting and 11,000 man-days of fishing valued at about \$33,000 annually.

a. Small Game. Berms, spoil banks, and right-of-way or uncleared sides along all altered channels will be made available for public hunting and fishing access, thus hunting opportunity will be greater in these areas than it is presently. Approximately 2,500 acres are recommended for purchase in the vicinity of Tenmile Pond to mitigate losses subject to monetary evaluation and intangible losses associated with the project. Some 1,200 acres of these lands will provide the amount of hunting shown in Table I.

b. Waterfowl. Two mitigation measures will affect waterfowl hunting within the project area. Easements will be acquired on some 4,900 acres of sump lands to permit annual fall and winter flooding and public hunting following the harvest of crops. These lands, mostly cleared for agricultural purposes, will provide low density public hunting opportunity amounting to an estimated 1,000 man-days annually. More significantly, these lands should provide attractive resting and feeding areas for migrant waterfowl both during and following the hunting season. An additional 1,700 annual hunting trips are capable of being provided on 1,200 acres of the land proposed for acquisition in the Tenmile Pond area (discussed in the preceding paragraph), since it is assumed that the area will be developed so as to permit shallow flooding by manipulating the water level. The combined features of sump easements and fee title acquisition of 1,400 acres will provide approximately 3,000 waterfowl hunting trips annually (Table I).

c. Sport Fishery. The project will provide public access to some 380 acres of existing borrow pits which provide good to high quality fishing opportunity. In addition to the acquisition of 2,500 acres of land in and adjacent to Tenmile Pond, a gated control structure will be installed at the lower

end to permit water impoundment up to at least elevation 287 feet msl. The maximum water level will inundate about 400 acres. Water levels will be fluctuated to accommodate flood-water storage. A minimum impoundment of 200 acres will accommodate nearly 11,000 man-days of fishing annually (Table I). Other features of the Tenmile Pond development will contribute to improved water quality. A bypass channel around the pond will be necessary to provide drainage for some agricultural lands, and will divert considerable silt around the pond. A diversion structure will be installed at the upper end of the pond to regulate flows from the bypass channel and to permit proper management of the pond and associated mitigation lands.

3.122 Mitigation of Non-Monetary Losses. Lands in excess of those required to mitigate monetary losses to hunting and fishing will be necessary if project damages are to be largely ameliorated. Intangible losses to environmental quality will be substantial. The fact that the native woodlands have been more than 95 percent cleared in the study area places a premium value on the wildlife habitat as well as the natural esthetics and other intangible qualities of remaining resources. Remaining strips and patches of woodland provide the only relief in the otherwise monotonous scene of row crop farming which dominates the landscape throughout the Missouri Bootheel Region. This area is currently deficient in all types of outdoor recreational opportunity. Remaining woodlands and ditch-bank vegetation provide essentially the only source of food and cover for many nongame species of birds, mammals, reptiles and amphibians as well as some game animals. These areas further provide some degree of nonconsumptive recreation such as nature study, hiking, bird-watching and photography. More subtle and harder to define are the implications of these resources to human happiness and mental well-being. It is with a view to offsetting unavoidable consequences of project construction, such as woodland clearing and lowered water quality, that lands in excess of those required to fully mitigate monetary losses are recommended for acquisition. Approximately 2,500 acres to be acquired in fee title, along with the other measures previously described, have been agreed upon by local people, the responsible fish and wildlife interests, and the U. S. Army Corps of Engineers as satisfactorily fulfilling the requirements for mitigation. Some \$33,000 in annual hunting and fishing benefits (Table I) will be derived from easements on 4,900 acres of sump lands and fee acquisition of 1,400 additional acres (part of the 2,500 acres in Tenmile Pond). The latter will consist of about

4. ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED
SHOULD THE PROPOSAL BE IMPLEMENTED (WITHOUT MITIGATION)

4.01 PHYSICAL IMPACTS

Esthetic degradation associated with the clearing of woodlands and trees and other vegetation along channels through channel enlargement is an unavoidable consequence of project construction. This impact will become less severe as vegetative growth becomes reestablished along ditch banks. However, the berm along the stream side of the spoil bank will not be permitted to grow back with woody vegetation since this space must be kept clear for periodic channel maintenance activity. Thus, the esthetic and practical environmental values associated with trees growing adjacent to the stream itself will be permanently lost along one side of all enlarged channels. Pumping stations, once in place, and with consideration given to their physical appearance, landscaping, and proper maintenance, should not significantly degrade the natural environment.

Any method used to dispose of vegetative material cleared as a direct or indirect consequence of project construction may cause some adverse, though temporary, environmental impact.

4.02 BIOLOGICAL IMPACTS

Nearly 7,400 acres of existing woodlands, which includes ditch-bank vegetation, are estimated to be cleared as a consequence of project implementation. About 400 acres of trees and other vegetation will be cleared along ditch banks to facilitate channel enlargement. The additional losses to woodlands are expected to result from the action of individual landowners who will convert privately owned woodlands to agricultural uses.

Wildlife dependent upon woodland habitat will be reduced commensurate with habitat loss. Acquisition and management of 2,500 acres of mitigation lands, along with easements for winter flooding of an additional 4,900 acres of sump lands, will not replace existing wildlife populations and annual production lost, even though hunting opportunity will be nearly three-fourths of the preproject conditions as a result of guaranteed public access to these lands.

Water quality and fishery resources in the altered channels will be impaired, although initial impacts upon

worthy of exploration or preservation. The fact that construction, for the most part, will be confined to the enlargement of previously constructed channels lessens the probability of disturbing undiscovered sites. Should such discoveries be made, appropriate measures will be taken to salvage or preserve these sites, including channel realignment where necessary. All lands subject to land forming operations as a result of the project (particularly woodlands expected to be cleared) will be included in an archeological reconnaissance prior to the initiation of any construction activity.

5. ALTERNATIVES TO THE PROPOSED ACTION (WITHOUT MITIGATION)

5.01 ABANDONMENT

The most obvious result of project abandonment is that water resource development objectives will not be met. Anticipated future conditions without a project are described in detail in Section 2, Future Environment Without the Project, and are summarized as follows:

5.011 Environmental Impact. Air quality is expected to remain relatively high in the future with the expected enforcement of emission standards. All other elements of the natural environment will be further degraded. Water and woodlands will be adversely affected as some additional land is cleared and more intensive farming is practiced. Local interests will accomplish this through some channel enlargement and more intensive maintenance. Fish, game and waterfowl will suffer concomitant losses.

5.012 Social Impact. Esthetic values of existing wooded areas and ditches will continue to decline as agricultural practices induce some additional clearing for ditch maintenance. There will be some continued displacement of people residing in persistently flooded areas, or who financially are unable to cope with costs of flooding or flood protection measures. The mutual problem of flooding and drainage will promote community cohesion. Desirable community growth will be an unattainable goal until problems related to flooding, drainage, water quality, urban sanitation, and inadequate recreational opportunities are solved. Archeological and historical interest in the area will grow, as will development of outdoor recreation facilities not related to hunting, fishing, or camping.

5.013 Economic Impacts. Without the project, drainage and flooding problems in the study area will slowly lessen as local interests implement small piecemeal drainage measures. Agricultural production will not be optimized. Flood damage will continue to affect some 124,000 acres representing the interests of about 1,200 landowners. Benefits estimated at \$3,487,500 annually will be foregone. Urban areas, particularly the city of Sikeston, will be seriously impeded in future growth without the project. The area is attractive to industry because of the mild climate, large amounts of water, and diversity of transportation facilities, including water-borne. Lack of adequate internal drainage systems and

a. Plan No. 2. Plan No. 2 consists of channel improvement on 5.2 miles of ditches in Sikeston. This plan would employ use of a diversion ditch north of the city of Sikeston and modification of Lateral B and Lateral C to provide adequate flow capacity to protect the area from a storm having a frequency of occurrence of once in three years.

b. Plan No. 3. To provide effective control of floods up to and including the 10-year return frequency storm, this plan would consist of major channel rehabilitation on those ditches mentioned in Plan 2.

This plan would provide the greatest amount of protection for the urban area of Sikeston of those alternatives studied for the city.

5.022 Lower New Madrid Floodway Area. Alternatives to the proposed pumping station size considered for the Lower New Madrid Floodway area were 100, 250, and 750 cubic feet per second plants.

5.023 St. James Bayou Area. In the St. James Bayou the following alternatives were considered. Plan No. 2 is the recommended plan.

a. Plan No. 1. This project plan would consist of constructing a pumping station at the blocked outlet of St. James Bayou. Alternate capacities of pumping stations were designed to remove accumulation of runoff and seepage when heavy rains occur in the study area. Pumping station capacities studied included 200 and 1,000 cubic feet per second plants.

b. Plan No. 3. Plan No. 3 would consist of a pumping station described in Plan 1 above, constructing an outlet structure with an opening of 300 square feet, 11.0 miles of channel modification (bottom width of 150 feet) and construction of 4.0 miles of new channel. A greater degree of interior gravity drainage could be effected by this plan than in the previous plan.

c. Plan No. 4. Plan No. 4, consisting of a pumping station as described in Plan No. 1 above, constructing an outlet structure with an opening of 400 square feet, channel improvement on 11.0 miles of ditches (increasing the bottom width to 210 feet), and construction of 4.0 miles of new channel, would provide the greatest amount of protection of those alternatives studied in the St. James Bayou area. The components contained in Plan 4 would work together effectively to reduce accumulated interior flooding.

hunting since this sport is no longer available in the study area due to an insignificant deer population. A reduction in winter flooding which either alternative would accomplish would have a significant impact on the waterfowl distribution and waterfowl hunting in the study area. The present estimate is that the area can support some 4,200 annual waterfowl hunting trips. This opportunity will be reduced to 1,000 annual trips by Alternative No. 1 and 500 annual trips by Alternative No. 3.

As with the recommended plan, the aquatic environment will be adversely affected by either of the alternative plans. Causative factors include increased erosion, heavier sediment loads, removal of streambank cover, greater pesticide pollution as a result of more intensive agricultural practices, removal of streambank shade and instream debris, and the periodic disturbance of the area for maintenance preventing natural recovery of the system.

This loss of and damage to aquatic habitats will naturally result in reduced fish diversity and population, and a decrease in sport fishing opportunity. Fisheries will be further damaged as a result of reduced overbank flooding and a consequent reduction in natural restocking of borrow pits with fish from the streams and from Mississippi River backwater. Sport fishing will be reduced from an estimated 13,500 annual trips to 7,000 annual trips if Alternative No. 1 is implemented and 6,200 annual trips if Alternative No. 3 is implemented.

A summary of fishing, hunting, and trapping values resulting from the three alternatives is displayed in Table II.

The peregrine falcon and the northern bald eagle are the only nationally rare or endangered species which may occur in the study area. Other species listed as rare, endangered, or of undetermined status in southeastern Missouri are listed in Section 2. No known species of rare or endangered plants occur in the project area. Alternative No. 3 will be more damaging to habitat than will the recommended alternative or Alternative No. 1. The impact on rare or endangered species is directly proportionate to the reduction in habitat. Although it cannot be said that either alternative channel will result in the extirpation of any particular species, the removal of some natural habitat upon which these species are dependent for food and cover will certainly place further stress on these threatened, uncommon or rare species.

TABLE II (Contd)

	Future Without a Project and With Three Different Alternatives					
	Alternative No. 2			Alternative No. 3		
	Man-Day Value	Annual Trips Per Acre	Habitat Acres	Annual Trips	Annual Value	Loss
Hunting						
Small Game						
Ditch Bank	1.50	0.1	374	37	56	
Woodland	1.50	0.1	1,550	155	233	
Waterfowl	6.00	0.5	1,550	775	4,650	
Total Hunting				967	4,939	21,966
Trapping						
Fur Bearers	-	-	-	-	234	1,066
Sport Fishing						
Unaltered Channels	1.50	10.0/mi.	69.0	690	1,035	
Altered Channels	1.50	5.0/mi.	85.0	425	638	
Borrow Pits	1.50	15.0/mi.	380.0 ac.	5,700	8,550	
Total Fishing				6,815	10,223	10,117
TOTALS					15,396	33,149
					(15,400)	(33,100)
					6,164	9,246
					12,737	35,808
					(12,700)	(35,800)
					156	1,144
					648	3,335
					525	3,150
					18	27
					105	158
					177	
					1,050	
					0.1	
					0.1	
					0.5	
					1,050	
					525	
					3,150	
					648	3,335
					23,570	
					1,066	
					156	1,144
					344	516
					120	180
					8,550	8,550
					6,164	9,246
					11,094	
					12,737	35,808
					(12,700)	(35,800)

The increase in agricultural activities that would be stimulated by either alternative would also increase land values and tax revenues, and regional and national economic growth. Business and industrial activity, especially that related to farm processing, will be stimulated by either plan. However, additional industrial development on flood plain lands will remain infeasible. Construction of the project will require that local governments contribute to the project costs, primarily in the form of right-of-way and local maintenance of the channel enlargements.

These economic impacts are the same as those of the recommended plan discussed in Section 3. When compared with the effects of the recommended plan, Alternative No. 1 and Alternative No. 3 will show a decrease or increase, respectively, in the magnitude of the impacts.

The effects of either alternative on income distribution or energy consumption will be insignificant as it will be with the recommended plan.

5.029 Flood Storage. Development of reservoirs to store excess runoff during and following periods of heavy rainfall is often an effective means of flood control. Such structures can be operated to reduce the discharge rate, allowing excess runoff to be released gradually following heavy storms. The discharge rate can often be reduced to levels within the capacity of the downstream channel or to reduce the size or extent of channel enlargement needed downstream to effectively control flooding.

There are no suitable sites for flood control storage structures in the St. Johns Bayou and New Madrid Floodway areas because of the flatness of the terrain. Following investigation of the topographic features of the area, it was determined that this technique could not be effectively used in the study area.

5.03 NONSTRUCTURAL MEASURES

5.031 Flood Insurance. Flood insurance is not a true alternative to flood control as it does not prevent flood losses. Rather, it redistributes the cost of flood losses to a greater area and to a larger number of people. It protects individuals from catastrophic personal loss. The residents of the St. Johns Bayou and New Madrid Floodway may be eligible for two types of insurance programs. These are the National Flood Insurance Program sponsored by the U. S. Department of Housing and Urban Development which will protect homes and small businesses, and crop insurance administered by the Federal Crop Insurance Corporation, Department of Agriculture.

5.034 Flood Proofing. Flood proofing consists of adjustments of structures and/or their contents to prevent the entry or damages by floodwater. Approaches generally taken include raising the buildings or their contents above the expected flood level or sealing openings in the buildings to impede the entry of floodwaters. The disadvantage of flood proofing in this area, particularly, is that it cannot be implemented on croplands. Since 95 percent of the lands in the St. Johns Bayou and New Madrid Floodway are in agricultural production, flood proofing would do little to reduce total damages in the area. The result would be almost no change in the present conditions.

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

Flooding subjects lands and improvements within the study area to damages nearly every year. Flood control is essential to the maintenance and enhancement of long-term agricultural production. Providing this protection will result in the clearing of additional woodlands because of the prospects for both short-term and long-term gains in agricultural income. Agricultural expansion will result primarily in increased soybean and cotton production. Woodland losses will reflect corresponding decreases in wildlife populations which are dependent upon forest habitat. If improved drainage and flood control is not provided, and profits diminish as a result of increased crop damages or a drop in prices, marginal farm land will be converted to pasture or will revert back to woodland. Drainage provided by the project will result in agricultural land-use intensification throughout the foreseeable future. Thus, long-term environmental amenities associated with existing woodlands and water courses will suffer net losses in return for immediate and relatively long-term agricultural benefits. It is possible that environmental impacts may outlast the period during which economic gains will be derived from the project. However, economic benefits appear likely to extend throughout the period of project analysis.

7. ANY IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES WHICH WOULD BE INVOLVED IN THE PROPOSED ACTION SHOULD IT BE IMPLEMENTED

Changes in land use which will result from the project are neither irreversible nor irretrievable. However, any such changes can be expected to extend throughout the life of the project.

Degradation of water quality related to channel enlargement will exist to some degree as long as the new dimensions of the altered ditches are maintained. As with the case of land use changes, the impacts to aquatic resources could be lessened if the intensity of agricultural production were reduced. Present land use trends do not indicate such a possibility in the foreseeable future.

Lands placed in public ownership will preclude their conversion to agrarian uses. Many of the resources associated with these lands would inevitably be sacrificed to other uses without implementation of recommended mitigation measures.

There are presently no known archeological or historical sites which will be destroyed by the project. However, there is the possibility that future investigations may reveal Indian mounds for which measures must be taken to prevent their destruction as a consequence of project works.

8. COORDINATION WITH OTHERS

8.01 PUBLIC PARTICIPATION

Informal meetings and field investigations were made throughout the course of the study with landowners, conservation groups, and representatives of resource management agencies. The purpose of these meetings and field trips was to fully coordinate with all interests and better understand the needs and effects of alternate projects in the area.

Formal opportunities, in the way of public meetings, were provided for public participation in determining existing conditions, project needs, developing project alternatives, and in determining environmental, economic, and social effects of various project alternatives. Public meetings held are as follows:

Public Meeting of 2 April 1968. An initial public meeting was held at Sikeston, Missouri, on 2 April 1968, and was attended by representatives of Federal agencies, state and local agencies, and individual local interests. The meeting was held primarily to obtain the views of interested parties with respect to flood control needs and other water and related land resources needs of the study area.

Public Meeting of 27 April 1972. A plan formulation stage public meeting was held at Sikeston, Missouri, on 27 April 1972 to present the results of studies to that date. The purpose of the meeting was to solicit opinions concerning the feasibility of alternatives that were presented and other alternatives which might have been overlooked. This meeting was attended by people representing the various interests in the study area.

Public Meeting of 18 April 1974. A final public meeting was held at Sikeston, Missouri, on 18 April 1974 to present the results of the U. S. Army Corps of Engineers' investigation. A description of the plan to be recommended and a comparative description of alternatives considered at that point in the investigation were presented. Approximately 200 people attended the meeting and over twenty persons expressed their views. All of those who voiced an opinion recognized and supported the need for flood control improvements and spoke in favor of the project presented at that meeting; however, there were some requests for additional flood control improvements which were considered in preparation of this final report.

lands to be purchased in Tenmile Pond was agreed on in discussion attended by representatives of the Bureau of Sport Fisheries and Wildlife, Missouri Department of Conservation, Soil Conservation Service, Corps of Engineers and local interests on 4 and 11 December 1973. Exact location of lands to be purchased are determined immediately prior to construction of the project. This requires detailed land surveys, office studies, and real estate studies. Determining the exact location at this time would not allow consideration of environmentally related factors prevailing at the time of actual construction.

It was agreed at the 4 and 11 December 1973 meetings that flooding up to elevation 285 feet mean sea level in the St. Johns Bayou area and 284.4 feet mean sea level in the lower New Madrid Floodway area be permitted for waterfowl management. These areas can be delineated on any topographic map.

Actual channel dimensions, tentative alignment, and other physical elements were provided to representatives of the Bureau of Sport Fisheries and Wildlife by telephone conversation and meetings in the Memphis District office. Exact alignment, however, is not firmly fixed at this stage of planning. Exact channel alignments are determined immediately before actual construction of individual increments. This determination can only be made after detailed surveys, foundation inspection, site inspection, inspection of aerial photographs, etc. are made. This process includes determination as to feasibility of "one-sided" enlargement. The total environment of the project area is in a dynamic state and it is strongly believed that needs can best be served by taking into account all environmental, cultural, social, and economic factors existent at the time actual construction is to take place. To arrive at firm, inflexible overall channel alignments at the present time would be detrimental to practically all interests concerned.

The proposal to install two channel plugs to block the drainage ditches (Wilkerson Ditch and St. Johns Diversion Ditch) near Barker Ridge was discussed on pages 25 and 26 of the Draft EIS which you reviewed and is discussed on pages 17 and 18 of this EIS.

Comment No. 3. Known mineral resources of the project area consist of clay and sand and gravel. An examination of library and file data, without benefit of field investigation,

1. Purchase in fee title of 2,500 acres in Tenmile Pond will reduce woodland clearing by an estimated 1,720 acres.

2. It is probable that use of flowage easements annually on sump areas (4,900 acres total) will prevent clearing of 1,300 acres of woodlands.

3. "One-sided" channelization will directly reduce woodland clearing by 200 acres.

Simple deduction indicates that the recommended project (both flood control and mitigation) will result in direct clearing of 200 acres of trees and other vegetation along the channels as compared to 170 acres as reported in the Memphis District, Corps of Engineers, letter dated 21 April 1972, and will result in indirect clearing (projected agricultural expansion) of 3,980 acres of woodlands as compared to 2,810 acres reported in above referenced letter. The reason for the 1,170 acres discrepancy is that projections indicated that it would be feasible to clear this land based on January 1974 price levels whereas it was not feasible to clear this land based on April 1972 price levels. Average crop prices increased over 185 percent during that period.

Comment No. 5. Page 26 states that the well-being of trees in the Big Oak Tree State Park is independent of flows in the St. Johns Diversion Ditch. We believe that there is insufficient evidence for this statement. Slight changes in ground-water elevation can result in significant change in the growth of various types of vegetation, particularly mature trees.

Response. The groundwater drawdown will not extend over a maximum distance of approximately 500 feet on each side of the channel due to the soil type in the aquifer. While effecting the groundwater level a short distance on either side of the channel; the high permeability of the substratum sands would allow a quick recharge of the area from rain and ensuing overbank flooding.

Comment No. 6. Page 28 states that the use of herbicides to control regrowth of bank vegetation would be a significant constraint to future improvement of water quality and aquatic habitat. Recommendation 10 of the Bureau's 1/ January 10, 1974, report urged that project channels be maintained with mechanical means or weirs rather than chemical herbicides. This recommendation and reasons for accepting or rejecting it should be thoroughly discussed in the final statement.

lost as a result of timber clearing operations. Over the life of the project and beyond, or until preproject conditions return to the affected areas, the number of songbirds and the non-game wildlife species thus eliminated would be tremendous. Since less than 2,500 acres of woodland habitat will remain after project construction, opportunities to significantly reduce this loss are quite limited. The final environmental statement should devote a more balanced discussion to the net impacts of the project on nonconsumptive recreational opportunities.

Response. Adverse impacts which cannot be avoided with the project following implementation of recommended mitigation measures are clearly defined in Section 4 of the EIS. Songbird populations will undoubtedly be overall reduced; whether to the extent stated in the above comment is purely conjectural. Many songbirds thrive in border or edge habitat, much of which will remain along ditch banks, fence rows, and roadways. The loss of woodland blocks is thus not necessarily reflective of a proportionate decrease in songbirds.

Woodlands acquired for mitigation will not be the only forest habitat remaining following project construction. A minimum of 1,000 acres of ditch bank cover (mostly woods) will remain and 1,550 acres of forest tracts will not be provided sufficient protection to warrant clearing. Woodlands preserved by mitigation will be of higher overall quality than the heavily cut-over woods presently occupying these lands.

Non-consumptive recreational uses will be essentially limited to lands in public ownership. Scattered, privately-owned woodlands presently existing in the basin provide little, if any, of these types of uses.

Comment No. 9. In regard to the understanding of the Bureau of Sport Fisheries and Wildlife and the Missouri Department of Conservation, page 45 notes, ". . . . both agencies are in agreement as to the adequacy of proposed mitigation measures if the project is constructed" The fact that the Bureau of Sport Fisheries and Wildlife and the Missouri Department of Conservation recommendations concerning mitigation measures were based on inaccurate and very significantly lower acreage figures for wildlife habitat lost as a result of the project invalidates this statement. The Corps' failure to provide current and accurate project data on which to base mitigation recommendations and the ramifications thereof should be clearly pointed out and thoroughly discussed in the final statement.

Response. See Comment No. 4.

and woodland habitat are lower than can realistically be expected. We do not, however, believe that this is an important issue because hunting and fishing use is not necessarily related to habitat mitigation needs.

Response. Although estimates of hunting and fishing trips may be conservative, they are considered reasonable in view of estimates provided by the Fish and Wildlife Service on other projects. Reference is made to Fish and Wildlife Service (BSFW), letter of 24 January 1973 from the Atlanta Regional Office regarding the Corps' acquisition of approximately 14,000 acres of lands for fish and wildlife mitigation for the St. Francis feature of the Mississippi River and Tributaries project. On page 2 of this letter the following statement is made: "Alternative area number 1 is capable of providing 14,000 man-days of hunting annually with only public access and basic management. With development and more intensive management the wildlife-oriented use could be doubled". The area being discussed is essentially a contiguous woodland block adjacent to the Mississippi River which supports huntable deer populations in addition to waterfowl and many small game species. The area is also probably capable of supporting huntable turkey population. Hunting and fishing estimates contained in Table III of the EIS are applicable to project lands comprised mostly of small, scattered woodland tracts in private ownership (without mitigation).

Existing hunting opportunity is estimated to total 0.57 trips per acre annually. This compares to 1.0 annual trip per acre in the BSFW letter on mitigation lands "...with only public access and basic management..." and which consist of far superior woodland habitat supporting deer, which are not present in the St. Johns New Madrid Area. With mitigation, as shown in Table II of the EIS, only 3,000 annual hunting trips have been estimated on 7,000 acres of mitigation lands (2,100 acres of woods purchased in fee title and 4,900 acres of sump areas upon which easements will be obtained to permit post-crop season flooding for the benefit of waterfowl). Thus, if pre-project hunting values are conservative, the values credited to mitigation features are even more conservative. The Corps agrees that hunting and fishing use is not necessarily related to habitat mitigation needs, and for this reason has recommended the acquisition of lands considerably in excess of those required to replace monetary losses to both hunting and fishing.

will decrease the threat of algal blooms because of increased turbidity in the water. Pesticide information is not available but channelization would not affect the water quality regarding pesticides. The improved drainage in the proposed project area will increase flows which will assist in improvement of present water quality by dilution of harmful organics and nutrients.

Comment No. 2. The final statement should discuss the applicable state water quality standards and indicate if either construction or maintenance of the proposed project will violate the standards. The New Madrid Floodway has been designated by the Missouri Clean Water Commission as an effluent limited segment. An effluent limited segment is any segment of a stream where water quality is meeting and will continue to meet applicable water quality standards or where adequate demonstration indicates water quality will meet applicable water quality standards after application of the effluent limitations required by Section 301(b)(1)(A) and 301(b)(1)(B) of the Federal Water Pollution Control Act Amendments of 1972. It appears the project will not have any benefits for maintenance of water quality standards or related public health needs.

Response. The predicted impairment of water quality as described in the final EIS is essentially limited to ditches in the St. Johns Bayou area where over 80 percent of channel alteration will occur. Since there are no urban or industrial developments in the New Madrid Floodway, and very limited human habitation, there is not expected to be any significant source of effluent discharge into the drainage system. The New Madrid Floodway development should definitely have benefits for maintenance and possibly enhancement of water quality and related public health needs. The present rapid rate of eutrophication of Tenmile Pond will be significantly reduced by the proposed control of inflow and water levels. Silt-laden waters during heavy run-off will be diverted around the pond. Storage capacity of Tenmile Pond will be sufficient to permit maintenance of low flows downstream during dry periods. The stream frequently goes dry in some reaches under existing conditions. With installation of the outlet structure and pumping station on St. James Bayou, water flow will be restored to the lower reach of the channel. Since construction of the Mississippi Main Line Levee, flows have been diverted into the lower floodway through Barker Ridge via Wilkerson and St. Johns Diversion Ditches. Restoration of flow through St. James Bayou will eliminate stagnation and mosquito breeding conditions in that portion of the channel below St. Johns Diversion Ditch.

by other method(s) has been fully investigated and determined unacceptable or infeasible. Burning should be coordinated with state and local governments to ensure that it will not be in violation of states or local regulations. If disposal by burning is adopted a method such as forced air open-pit burning should be used to reduce particulate emission to the atmosphere.

Response. The method of disposal has not yet been determined but will likely be accomplished by burning, windrowing, burying, chipping, or removal to some disposal area. Should debris be burned, all applicable state and Federal regulations will govern.

Comment No. 6. Any channel modification may alter the natural circulation of the ground water. Natural recharge of the ground water may be increased or decreased depending upon location, depth, and other characteristics of the new channel. Thorough investigations of possible effects on both the quantity and quality of ground water should be made before undertaking this channelization project and the results included in the statement.

Response. Due to the flatness of the terrain, abundance of rainfall, and seepage, no appreciable change will occur in the water table.

Comment No. 7. There should be a discussion on the synergism of channelization and resultant increase in farm acreage utilization, which will produce a substantial decrease in the remaining acreage suitable for wildlife habitation. This should include a discussion in detail of the characteristics of the sites designated for wildlife habitat mitigation.

Response. The estimated loss of 7,000 acres of woodlands as a result of the project is based upon an assumption of "worst conditions" likely to occur if no mitigation is authorized. Much of the 7,000 acres is in small, scattered tracts - mostly less than 50 acres, and are little more than woodlots, or ditch bank and fence row woods. There is no assurance that all of these woods will be cleared. They are included in estimates simply because they exist in areas receiving sufficient drainage and/or flood protection from the project to make it economically feasible to convert them to cropland. Most of these woods are extensively cutover and, due to their small acreage, are not high quality habitat for many species.

activities, ecosystems consist of the natural physical environmental features and the plant and animal organisms which depend on the physical environment and each other for life support.

Response. The discussion on ecosystems has been expanded in the statement.

Comment No. 11. There are reports available which discuss the effects on water quality caused by various physical modification of streams. The following reports provide information which should be studied prior to the formulation of the channelization project and their discussion or reference included in the impact statement.

Methods to predict the effects of channelization projects are included in a volume produced by the Soil Conservation Service entitled, "Planning and Design of Open Channels" (Tech. Release No. 25). Chapter 7 is a recently included chapter on environmental considerations.

The Council on Environmental Quality "Report on Channel Modifications," (A.D. Little, Inc., March, 1973), presents the results of extensive biological investigations conducted by the Philadelphia Academy of Natural Sciences. Chapter 5 of Volume I of this report entitled, "Effects of Channel Modifications on Fish and Wildlife Resources, Habitat, Species Diversity, and Productivity" directly addresses the biological effects observed in channelization projects.

Response. Various books, reports, and manuals discussing ecology, biology, waterfowl, aquatic resources, water quality engineering, relative to stream channelization and its environmental effects were used in formulating the recommended plan as well as the above mentioned references.

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE

Comment No. 1. The statement does not reflect the effect of the proposed action on present or future SCS Projects. The only active SCS Project in the St. Johns Bayou and New Madrid Floodway at this time is the Spillway Area Watershed in Mississippi County.

Response. The effect of the proposed action on SCS Projects is summarized in the Comment No. 2.

Response. Landowners will find it profitable to convert woodlands to croplands for the same reasons they find it profitable to intensify cultivation on existing cropland; that is, reduced flood hazard and better drainage. In calculating the net return applicable to conversion of woodlands to croplands, all costs of production were considered including cost of clearing, cost of installing drainage facilities, increased taxes, etc. Also included as a cost was the annual return that the farmer could have realized had he retained his land in timber production under a soundly managed sustained yield forest regime. Costs of converting woodlands, installing drainage facilities, etc., were supplied by the Soil Conservation Service. A breakdown of the use of these costs is found in detail in the review report.

Comment No. 3. Alternatives to the proposed action could be expanded to include consideration of the use of bottomland forested areas for temporary floodwater storage. Such area, outside levee protected zones, could hold significant amounts of floodwater for short periods of time. It would seem possible that the amount of storage involved could result in benefits of flood damage reductions and reduced levee construction costs. At the same time, these bottomland areas could be managed to increase timber and environmental values; expanding multiple land use (flood control, timber, wildlife, esthetics, etc.) rather than reducing them to a single open land agricultural use.

Response. The study area is almost entirely surrounded by existing or authorized levees. Construction of interior levee systems was considered but would not alleviate flooding from accumulation of interior runoff and would further restrict runoff from entering mainstream channels; therefore, levee construction was not recommended as part of project plans.

Low areas will be used for storage of floodwater for short periods of time in the form of sump areas for pumping stations. These areas (4,900 acres) will also be operated so as to provide water for waterfowl hunting for approximately 2 to 3 months each year.

Comment No. 4. Table I on page 2a shows "Total Annual Charges for Fish and Wildlife Mitigation" of \$252,700. Table II on page 38 shows "Total Annual Value for Mitigation Replacement of Fish and Wildlife" of \$33,126. We do not understand the distinction.

Response. With respect to the first sentence, it is not at all clear how a review of the Draft Statement could result in such concern for the disappearance of "extensive wilderness areas". There is nothing resembling "wilderness" within the study area, unless it be Big Oak Tree State Park which will be unaffected by the project. We presume that the "single form of life" referred to in the second sentence is man, who is generally accepted as being dominant among creatures world-wide. The third sentence is paradoxical; it seems to imply that man's dominance in the Mississippi River Valley is tenuous. The Corps concurs in the last sentence, which is simply a statement of fact, and is the basis upon which the recommendation for mitigation in excess of quantifiable losses is founded.

Comment No. 3. The Draft Statement does encourage the purchase of approximately 2,500 acres for fish and wildlife management, but to support this small trade-off there must be a concentrated effort from the very beginning of this project proposal to recognize that all naturalistic species have claims upon man, natural rights which we should learn to respect. However, this would require a deep fundamental change of attitude toward all created things. Irregardless, there is a definite need to understand the depth of the change required from this project and this must be reflected throughout the Impact Statement.

Response. The purchase of 2,500 acres, along with other mitigation proposals described in the EIS, has been recommended for authorization and implementation as a full and equal project purpose in the Review Report. It is the very concern expressed in the above comment that resulted in the recommendation of mitigation features greatly in excess of what would be required to replace monetary losses to hunting and fishing.

Comment No. 4. Regretfully, in the present situation, none of the dominant ways of understanding the wildlife and all natural features of the low-lying areas of southeast Missouri entails total respect for their integrity or inherent value. As expressed throughout the impact Statement, the relationship is always determined by the relation of animals and plant life to man and the effect has become ruthlessly and one-sidedly destructive.

Response. Because of the limited remaining natural environmental features in the study area, a very high value was placed on those remaining during project formulation. Careful consideration was given toward preservation of as much of the natural environment as possible while also providing for flood control and social, cultural, and economic needs of the study area.

For example, the following environmental and ecological issues of the Draft Environmental Statement should be approached with a new vision of reality and a new self-understanding:

1. What is the positive justification for clearing 7,200 acres of hardwood forest?
2. Will the project provide protection to the urban communities for the 100-year flood event?
3. As a prime wintering area for mallards and nesting ground for the wood duck, will other refugee areas be over concentrated as a result of this project?
4. Will there be a need for extensive lateral ditching after the existing drainage ditches have been enlarged?
5. So as not to impair water quality and associated aquatic resources, has consideration been given to the use of levees to confine flood flows without disturbing the old ditches and the natural growth of trees and shrubs bordering them?
6. Why is intensive farming for this particular area so important? Is there a shortage of agricultural land in south-east Missouri and is it all being intensively used?

Response. The individual issues raised in the above comment are addressed as follows:

1. The recommended project in and of itself does not justify the clearing of 7,200 acres, nor is justification of the project based on the clearing. The environmental statement recognizes, however, that additional land clearing will take place by individual landowners because of comparative economic return on cropland as opposed to woodland. It should also be recognized that the 7,200 acres is not in a contiguous unit or even several large tracts, but consist of numerous small plots and timber strips, primarily along stream banks. Woodland of this character does not have the character normally envisaged in quality timber land or wildlife habitat.

2. The proposed project is formulated to provide optimum economic levels of protection for both rural and urban communities, but does not provide for a 100 year level of protection. The project is formulated to provide protection for agricultural acres, but will benefit urban communities

The purpose of the law is: (a) to protect flood victims by assuring the availability of reasonably priced flood insurance, and (b) to minimize future flood damage by controlling development in areas subject to flooding. In accomplishing the latter, HUD and the Federal Government have been given a key role in land use decision making in communities applying for flood insurance.

All communities within your project area have been contacted and informed by the Bootheel Regional Planning Commission that they contain one or more "flood risk" areas. Flood risk under the legislation is defined as a one percent chance of flooding in any given year, i.e., a probability of a flood once every 100 years. Each community in the St. John's Bayou and New Madrid Floodway drainage areas have been asked to apply for admission to the flood insurance program after adopting regulations containing a building permit system. Those who do not join the program by July 1, 1975, will find land development and other real estate activity in the flood areas cut off from most sources of financial assistance. The ultimate purpose of the Flood Disaster Protection Act is to assure that a larger proportion of the flood loss costs will be covered in the future by insurance rather than by the use of public funds.

We feel that the National Flood Insurance Program can promote the public interest by providing appropriate protection against the perils of flood losses and at the same time encourage sound land use by minimizing exposure of property to flood losses. The program is a cooperative effort between the Federal Government and the private insurance industry, which is represented by the National Flood Insurers Association. Special questions relating to the program should be addressed to the Federal Insurance Administration, U. S. Department of Housing and Urban Development, 451 Seventh Street, S. W., Washington, D. C. 20410.

Response. The effectiveness of the Federal Flood Insurance Program and the Flood Disaster Protection Act of 1973 are recognized, particularly as related to reducing increased damages in conversion of flood plains to urban use, or construction of improvements in flood areas. The proposed project is formulated to reduce damages to existing development, and primarily losses to crops and agricultural land uses. These existing damages will not likely be reduced significantly by the insurance program. The proposed flood control project and the flood insurance program should compliment each other in the project area.

quantitatively. In the years ahead, there will be an increasing need to understand these interactions more reliably, more implicitly, and for deeper reasons. To deal with and respect this valuable lowland area, and all the lands along the Mississippi River, it will not be enough to predict which way things will change; there will be a definite need to know how much change and for what reasons. It is about interactions and their mechanisms where more knowledge and understanding must be gained so as to restore quality to the total environment and to better understand the longer range impacts. It would appear that from past experiences, dealing with disasterous floods, water quality, and ecological impacts that we should eventually begin to conform to nature's principles of respect and stability.

Response. Comment noted.

Comment No. 10. We recognize that political and economic power is vast and the proponents of the proposed projects will naturally defend themselves, but sooner or later independent scientific authority must say whether the continued channelization of drainage areas, clearing of woodlands, and the draining of lowland areas can be rendered as being sound on the scale and in the way it is being proposed throughout this section of the Mississippi River Basin.

Response. Channelization has long been utilized as a drainage tool and continues to be used because of its effectiveness. The environmental impacts of removal of vegetation may be severe, such as removal of a natural filtering system, esthetic degradation, loss of food and cover, and loss of oxygen producers and soil stabilizers. However, the most casual observer notes little indication of land use policies effectively protecting the flood plain vegetation. Accordingly, it seems desirable to opt for a plan which will provide the much needed flood protection and also provide development of existing fish and wildlife resources based on recommendation of fish and wildlife agencies.

Comment No. 11. From the data outlined and presented in the Draft Statement, it appears that the proposed project improvements are more for short-range conveniences rather than to gratify comprehensive long-range environmental needs. We appreciate the opportunity afforded us by the Corps of Engineers to review and comment upon this draft statement, and look forward to receiving a copy of the final statement when it becomes available.

Comment No. 2. The proposed project does not have an apparent impact on Department of Health, Education, and Welfare programs.

Response. Concur.

ADVISORY COUNCIL ON HISTORIC PRESERVATION

Comment No. 1. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement appears adequate regarding our area of expertise and we have no further comment to make.

Response. Comment noted.

OFFICE OF ECONOMIC OPPORTUNITY

Comment No. 1. Our staff has made a review of the proposal and find no undesirable effects on the environment or results contrary to the interests of the low-income population.

Response. Comment noted.

BOOTHEEL REGIONAL PLANNING COMMISSION AND ECONOMIC DEVELOPMENT COUNCIL

Comment No. 1. The Bootheel's A-95 PNRS Committee and the Bootheel Regional Planning Commission have reviewed and approved the St. Johns Bayou and New Madrid Floodway Plan dated January 1974. Members of the commission staff and commission members attended the public hearings conducted by the Memphis Corps of Engineers in Mississippi County on April 17, 1974 and in Sikeston on April 18, 1974.

Response. Comment noted. The meeting of 17 April 1974 was not a Corps sponsored meeting but rather a meeting sponsored by the Mississippi County Court.

Comment No. 2. Extreme interest has been expressed by the local people in the development of the Tenmile Pond project, which is included in this plan. The Bootheel Regional Planning Commission would appreciate receiving any information which the Memphis Corps of Engineers could provide concerning the progress of this particular element, once the total project is initiated.

U. S. Army Corps of Engineers' project. The EIS discusses the impact of the proposed Federally sponsored work.

Comment No. 4. Information supplied by the Memphis District Corps of Engineers to the Bureau of Sport Fisheries and Wildlife, Vicksburg, Mississippi indicated that there will be considerably less than the reported 7,000 acres of forest land conversion to agricultural purposes as a result of the project. The lower Corps of Engineers supplied figures were used in the Fish and Wildlife studies.

Response. See Comment No. 4, United States Department of Interior.

Comment No. 5. Borrow pits fisheries use should be stated in annual trips per acre rather than per mile as recorded for the 3 year and 10 year channels.

Response. This correction has been made.

Comment No. 6. Additional impacts may be anticipated if the recommended plan includes additional work on the Birds Point-New Madrid Levee Ditch as requested by local interests at the April 18, 1974 Public Hearing. The final EIS should reflect these effects if the project extension is recommended.

Response. Additional work on the Birds Point-New Madrid Levee Ditch is not a part of the recommended plan.

MISSOURI STATE HIGHWAY COMMISSION

Comment No. 1. No mention is made in the Environmental Assessment about the impact on the State Highway System and the proposed channel improvement will adversely affect existing bridge structures because of the necessity for extending or replacing. Although our working relationship with the Corps of Engineers should guarantee no adverse effects to the State Highway System, we feel that the Environmental Assessment should be expanded to include such obligations.

Response. In order to accommodate the proposed channel modifications, alteration or replacement of some of the existing bridges and culverts on roads, streets, highways, and railroads will be required. The costs for the alteration or replacement of these facilities are included in the total first cost for construction of the project.

The following sites are being prepared for nomination:

- (1) King Archaeological Site
- (2) St. John's Archaeological Site
- (3) New Madrid Historical District

Response. The above sites have been included in the EIS.

Comment No. 4. "...Mississippian Indian settlements..." is too limiting. The term "Mississippian" should be changed to "aboriginal" or "prehistoric" settlements.

"...New Madrid as the oldest American city west of the Mississippi River." Although this city was the earliest settlement by Americans, it is not the oldest city west of the Mississippi River. Ste. Genevieve was settled in 1735 and St. Louis in 1763. As now stated, it is misleading, and the sentence should be reworded to prevent misunderstanding.

Response. The above changes have been made.

Comment No. 5. The Mueller Archaeological Site appears to be in close proximity to the project and may be affected by it. The site's location is marked on the U. S. G. S. map for your coordination.

Response. The Mueller Archaeological Site is approximately two miles from the nearest proposed channel improvement and will not be affected by work as proposed in the recommended plan.

Comment No. 6. We applaud your commitment to the National Park Service's recommendations for an archaeological, historical, and architectural survey of the area and strongly urge that this survey be made prior to any ground disruption activities. This office would be interested in knowing who has been selected to do the survey work. We will be happy to cooperate with your agency or the surveyor in mitigating any adverse effects on Missouri's cultural resources.

Response. All surveys of archeological or historical resources associated with this project will be closely coordinated with the Missouri State Park Board.

Comment No. 7. "The potential for damaging sites as a direct result of project construction appears minimal." This statement is misleading because most of the channels and ditches in the project area are remnants of extinct channels

preservation of fish and wildlife resources in the study area." From an examination of the draft EIS, it is clear that the effect of the project will not be the preservation of fish and wildlife resources, but rather their decimation. The draft EIS, itself, says (Page 2 of the summary): "net losses to environmental resources are an inevitable consequence of project construction."

Response. The completed project as recommended will reduce the frequency and duration of flooding in the study area. As a result of the project, the mitigation features will aid in preserving fish and wildlife resources in the study area. Short term net losses to environmental resources will result from construction of the project; however, the term "environmental resources" (includes) is not restricted to fish and wildlife resources, but includes other environmental values which may be effected.

Comment No. 2. Increased land utilization and not flood prevention is the principal project benefit. Although, increased land utilization is not an announced purpose of the project, approximately two-thirds of the estimated annual benefits will come from replacing existing hard wood timber land cover with production of cotton and soybeans. These agricultural benefits from expenditure of public funds will accrue primarily to the small number of private land owners whose property is directly benefited. This hardly seems like a legitimate Corps of Engineers project; neither does it appear to be a fiscally sound concept.

Response. Increased land utilization through the reduction of the frequency and duration of flooding in the study area is a principal project benefit; however, these benefits will not come solely by replacing existing hardwood timber land cover with production of cotton and soybeans. Seventy-seven percent of the increased land utilization benefits will accrue as a result of increasing the efficiency of cleared lands already in agricultural production.

Comment No. 3. Increased agricultural use of study areas is not in the national interest. The Agricultural Consumer Protection Act of 1963 recognizes the great national urgency for improving recreation, wildlife, and timber production in private forests by authorizing Federal cost-sharing for the establishment of cover crops on agricultural lands removed from intensive cultivation. The draft EIS states that 95 percent of the two basins have already been converted from

petroleum resources, the energy requirement of the project, itself, and the subsequent fuel consumption by pumping stations would impose an additional, unnecessary, wasteful, drain on diminishing petroleum supplies.

Response. Energy consumption will increase during project construction and during subsequent operation of the proposed pumping plants; however, energies spent in combating floods will be reduced as a result of planned project features and the resulting savings of energy should more than offset energy consumed during construction and operation of the project.

Comment No. 6. Completion of the project would have little effect on industrial expansion. Page 17 of the draft EIS reports that "existing developments within the flood plains suffer frequent damage." Although the draft statement speculates that the completed project would increase land values and tax revenues, it concludes: "However, additional industrial development on flood plain lands will remain infeasible."

Response. Increased industrial expansion in flood plain areas is not a project purpose, and no benefits from such land uses were evaluated or used in project justification or formulations. Increased land values and tax revenues will result from the feasibility of more intense agricultural use.

Comment No. 7. The St. Johns Bayou and New Madrid Floodway project cannot survive examination under the Two-Objective System for Evaluating Proposed Water Development Projects. In October of 1973, President Nixon approved an enlightened two-objective system of water development project evaluation. In implementing his executive order, he directed that henceforth all such projects must give equal consideration to impact upon environmental quality, as well as to economic desirability. If the Corps will review this project under the "two-objective" philosophy, we believe it will fall far short of qualifying.

Response. Equal consideration was given to economic desirability and impact upon environmental quality as well as social well-being and cultural effects in formulating the recommended plan. The adverse environmental impacts of the project appear minimal in comparison to the biological disruption already experienced as a result of increased agricultural development through the basin, accelerated runoff, and channelization by local interests.

project to be an improper effort to improve non-public land values and commodity production through the expenditure of public funds for the benefit of private agricultural interests. At the heart of the proposal is the replacement of 7,200 acres of woodlands with an equal amount of cotton and soybeans. This project would use tax dollars to provide substantial financial gain to a relatively few persons at the expense of further depletion of already scarce and valuable fish and wildlife resources belonging to all the people of the affected state. The Sport Fishing Institute therefore urges either that the project be abandoned, or preferably, that it be replaced by a non-structural approach to flood control that would include the proposed fish and wildlife mitigation developments.

Response. Comment noted.

COMMENTS REQUESTED BUT NOT RECEIVED

American Duck Hunters Association
Citizens Committee on Natural Resources, Washington, D. C.
Environmental Information Center, Inc., New York, New York
Izaak Walton League of America
Lower Mississippi Valley Flood Control Association
National Wildlife Federation
The Nature Conservancy
U. S. Department of Commerce
National Marine Fisheries, NOAA
Ducks Unlimited
Dunklin County Sportsman Association, Kennett, Missouri
Environmental Defense Fund
National Audubon Society
Natural Resources Council of America
Pemiscot County Wildlife and Conservation Club, Missouri
St. John Levee and Drainage District
St. Johns Bayou Basin Drainage District
East Arkansas Planning and Development District
Ozark Chapter, Mo-Ark Sierra Club
Levee District No. 3 of the Mississippi County, Missouri
Wildlife Management Institute
National Park Service
U. S. Geological Survey

Copies of the Draft Environmental Impact Statement were furnished to the following:

Mr. Frank Ferrell
Mr. E. B. Gee, Jr.
Mr. Lloyd Hogan

In our earlier review of the draft statement, we indicated to the Corps our concern about a sand and gravel operation in the eastern portion of the City of Sikeston, Missouri. The Corps subsequently assured us that the project would have no adverse effect on this facility. Therefore, we have no objections to the revised statement as it relates to mineral resources.

Response. Comment noted.

Comment No. 2. It is stated in the environmental summary that "no known historical or archeological sites will be destroyed by the project" and it is stated in the impact section that none of the archeological sites included on the National Register of Historic Places will be directly affected by this project. A similar evaluation of effects on the historic sites listed on page 15 should be provided. The date of the National Historic Preservation Act is 1966, not 1965, as cited on page 15.

Response. At present, there are no known historical sites which will be directly affected by the project. However, should discoveries of historical nature reveal unknown sites, appropriate measures will be taken to salvage or preserve these sites.

Comment No. 3. Archeological surveys to be made should include all project features (pumping stations; sump areas; channel enlargement, clean-out, improvement, and construction; outlet structures; areas to be covered by spoil and berms; and lands to be purchased for wildlife mitigation).

Response. Concur.

Comment No. 4. The final statement should also present procedures to be implemented in the event that previously unknown cultural resources are encountered during project construction.

Response. U. S. Army Corps of Engineers construction specifications require immediate cessation of work upon discovery of a cultural resource.

At this point the resource is assessed as to its conformance with the National Register criterion. This information is discussed with the appropriate State Historic Preservation Officer and a determination made as to whether the resource will be nominated to the National Register of Historic Places.

area which is characterized by numerous sump areas and low-lying lands too frequently flooded under existing conditions to warrant clearing for agricultural purposes. Of course, many of the smaller tracts are farmstead wood lots which are simply maintained at the landowners' preference. Outside of Big Oak Tree State Park, the largest concentration of woodlands are located within the sump area of Tenmile Pond. Even here the woodlands are not contiguous, being intermittently broken by cleared areas, with the larger tracts comprising several hundred acres. Acquisition of 2,500 acres in this area will preserve an estimated total of 1,720 acres of woods.

Woodlands in the study area are primarily of value in their relationship to (1) esthetic values, (2) wildlife habitat and associated recreational uses, (3) water quality through stream shading and bank stabilization, and (4) prevention of sheet and gully erosion on croplands adjacent to streams (drainage ditches in this instance).

Timber production is not a significant use of woodlands now remaining in the basin. Stands are comprised primarily of second or third growth, and no major commercial timber operators are known to own or harvest woodlands in the study area.

It is the opinion of the Memphis District that the EIS adequately addresses the undesirable environmental effects related to woodland clearing.

Although esthetic degradation, loss of wildlife habitat, and impaired water quality should be of concern to all residents of the study area, the one aspect of timber clearing which is probably of most immediate concern to landowners is the prospect of increased soil erosion when they convert woodlands to cropland. It is a generally accepted proposition that erosion will be accelerated if vegetation is removed from the banks or areas closely adjacent to streams. (Other aspects of channelization which amplify erosion are higher stream velocities, more frequent high discharges, and fewer in-stream obstructions). Erosion can cause considerable economic losses. Whether it takes place along the banks of streams or across adjacent cultivated fields, erosion removes valuable topsoil. Sediment thus carried into the stream can result in aggradation with its attendant clogging of drainage structures and reduction in channel capacity, both of which increase operation and maintenance costs. Thus, for economic reasons alone, landowners should consider the long term consequences of woodland clearing.

DEPARTMENT OF TRANSPORTATION - Regional Representative
of the Secretary

Comment No. 1. The FHWA current 5-year planning program shows possible involvement of the New Madrid Birdspoint Ditch (non-feasible channel improvement) with proposed project S-560(3) at Wyatt City.

Response. Hydraulic studies performed during the study indicated that the existing Birds Point-New Madrid Levee Ditch would carry three-year return frequency storm flows without any channel improvement. As a result, the recommended project did not include the Birds Point-New Madrid Levee Ditch, and there should be no conflict with proposed project S-560(3) at Wyatt City.

Comment No. 2. The St. James Bayou leading southerly from Ten Mile Pond will intersect with proposed project S-1195(3) north of Big Oak Tree State Park. No other proposed highway projects will be adversely affected by the Floodway improvement.

Response. The proposed project, which includes channelization of St. James Bayou, will be coordinated with the Missouri State Highway Commission during detailed design and construction to insure compatibility of existing and proposed projects.

Comment No. 3. The temporary inconvenience to traffic caused by this project is not considered significant and when it is completed, it will be offset by improved traffic conditions on local and State Highway facilities.

Response. Comment noted.

DEPARTMENT OF TRANSPORTATION - United States Coast Guard

Comment No. 1. The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Federal Highway Administration stated that their regional administration had responded to a query from the Corps of Engineers. However, a copy of this reply has not been furnished the Federal Highway Administration Washington office. We have no comments to offer in addition to those submitted by the Federal Highway Administration regional office.

(b) The status of the Hess Archaeological Site, Mueller Archaeological Site and LaPlant Archeological Site has changed from pending acceptance to enrollment on the National Register of Historic Places.

Response. Page 15 of the EIS has been revised to reflect these changes.

Comment No. 2. Page 22 - Archaeological and Historic Elements

Lines 4-5 - "...All significant archaeological sites will be identified and protected by law." According to the 1971 Federal Executive Order 11593, it is the responsibility of the Corps of Engineers to survey the entire direct impact area, identify all archaeological, historical and architectural sites, and then evaluate these sites for eligibility for inclusion on the National Register of Historic Places. Your statement implies only significant archaeological sites will be considered. Enclosed is a copy of Executive Order 11593 and the revised counseling notes.

Response. We believe your interpretation of Corps of Engineers responsibilities under Executive Order 11593 is correct. The statement has been revised to more accurately describe the survey for archeological and historic resources which will be conducted.

Comment No. 3. Page 39 - Archaeological Impacts (Without Mitigation)

Lines 1-2 - "...The potential for damaging sites as a direct result of project construction appears minimal." The St. John's Archaeological Site, which is being considered for nomination to the National Register of Historic Places, is located at the junction of St. John's Diversion Ditch and St. James Bayou and appears to be in the direct impact area. Any adverse effects to this site must be mitigated.

Response. A map showing numerous minor and unexplored Indian mounds was provided the Memphis District by the Missouri State Park Board via the Bootheel Regional Planning Commission on 8 November 1971. However, detail was not sufficient to correlate these sites with proposed project works. As a result the Memphis District, in a letter dated 7 February 1974 to the State Historical Survey and Planning Office, requested an updated list of archaeological sites along with comments or observations concerning potential impacts from the project. A set of topographic maps covering

of Natural Resources. Surveys of archaeological or historical resources associated with this project should be coordinated with the State Historic Preservation Officer rather than with a particular agency.

Response. The subject correspondence, a letter dated 17 June 1974 from the Advisory Council on Historic Preservation, has been included in this EIS. The letter was not received until after the revised draft EIS had been printed and transmitted and as a result was not included.

Future correspondence related to surveys of archaeological or historical resources will be coordinated with the State Historic Preservation Officer.

Comment No. 6. Comments requested but not Received
Page 111 - Comments were received from the State Historical Survey and Planning Office. See comment 6 (b).

Response. The Memphis District forwarded a copy of the draft EIS on 2 April 1974 to the State Historical Survey and Planning Office for review and requested that comments relative to that review be furnished by 5 May 1974 for inclusion in the final statement. Comments were received by the Memphis District from the State Historical Survey and Planning Office via the Missouri State Parks Board. As a result page 81 of the EIS has been revised.

Comment No. 7. Appendix Letters Received After Review of Preliminary Draft

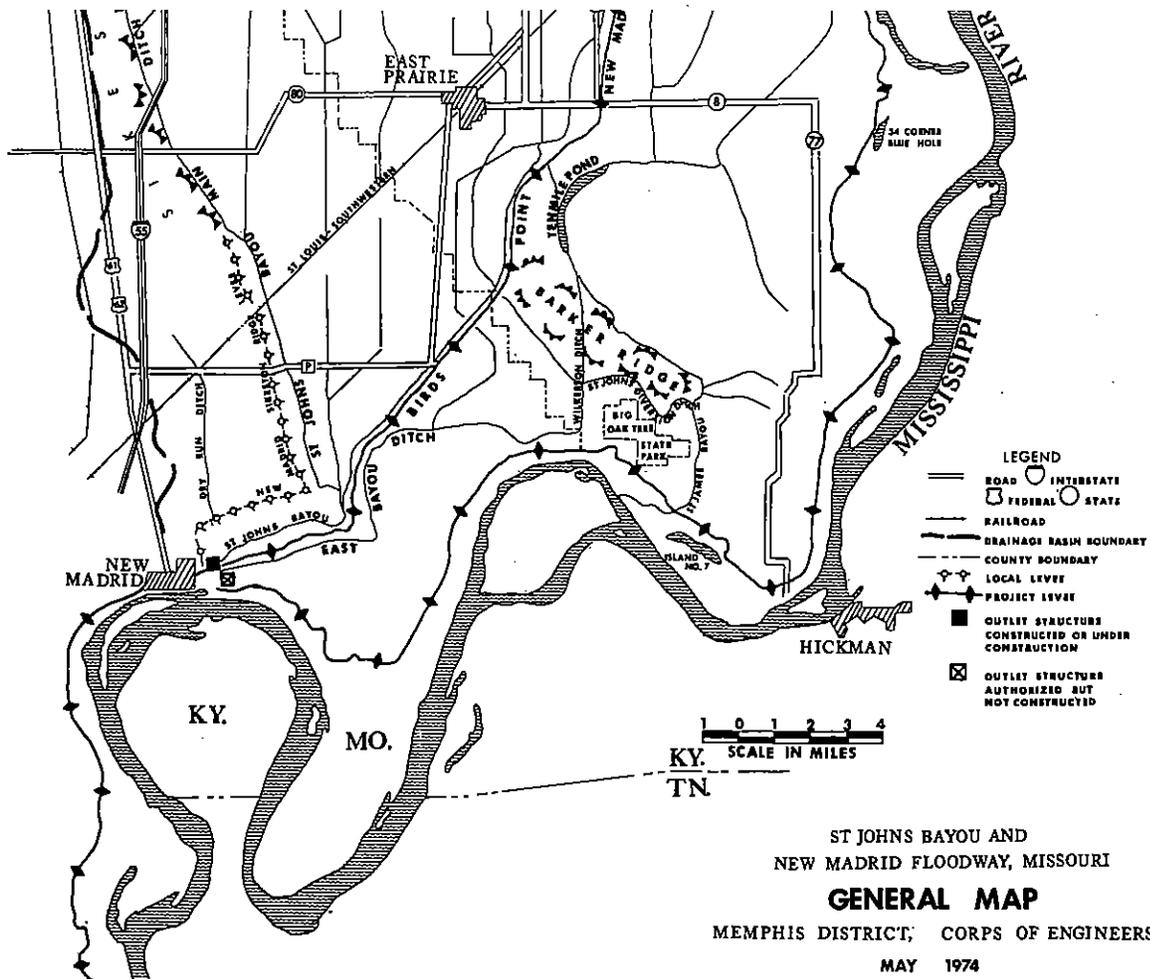
Advisory Council on Historic Preservation,

Although the May 6, 1974, correspondence from the Advisory Council on Historic Preservation is included, the June 17, 1974, comments are excluded. The June 17 correspondence supersedes the May 6 correspondence and we request the the June 17 correspondence be considered.

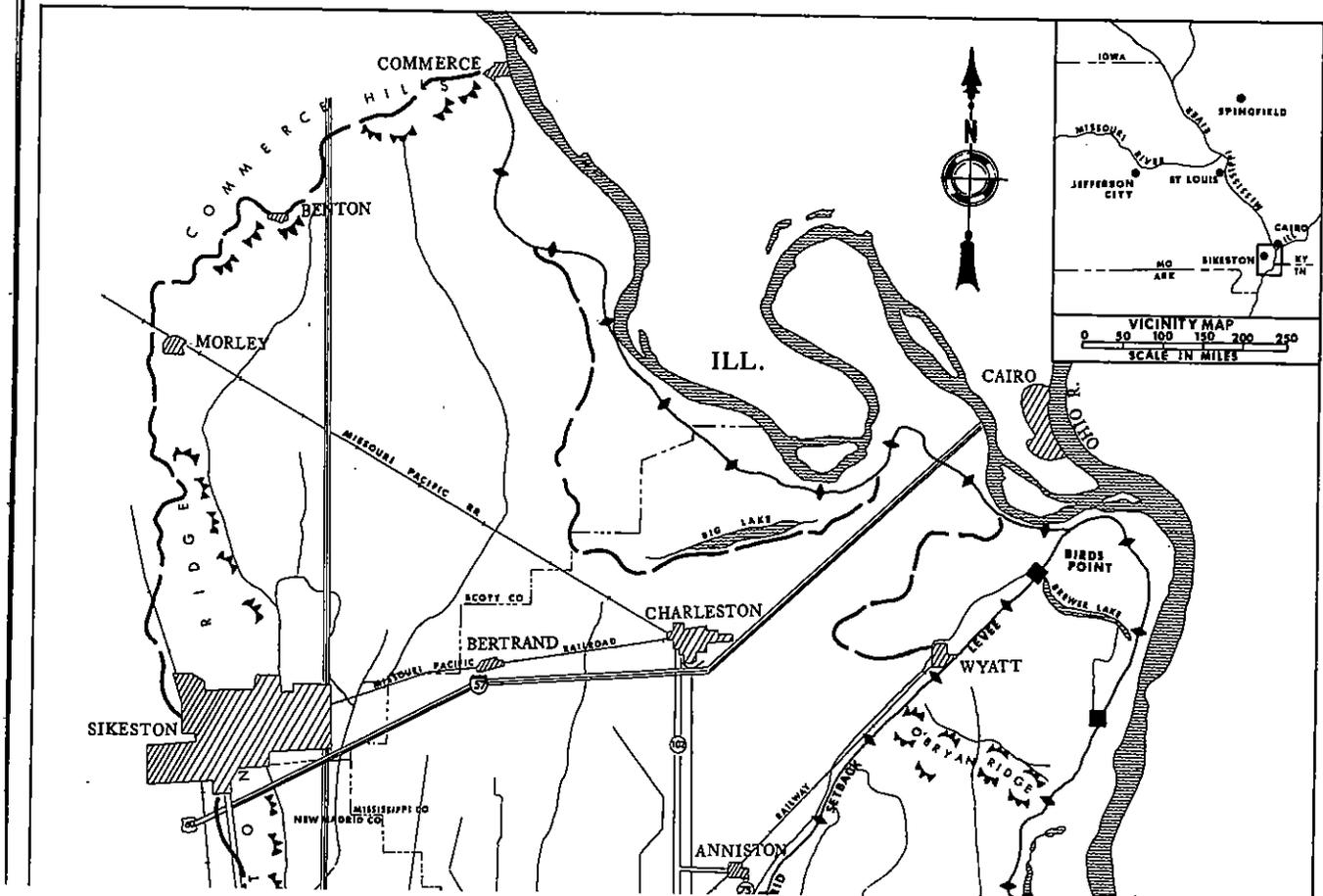
Response. The 17 June 1974 correspondence has been included in this EIS.

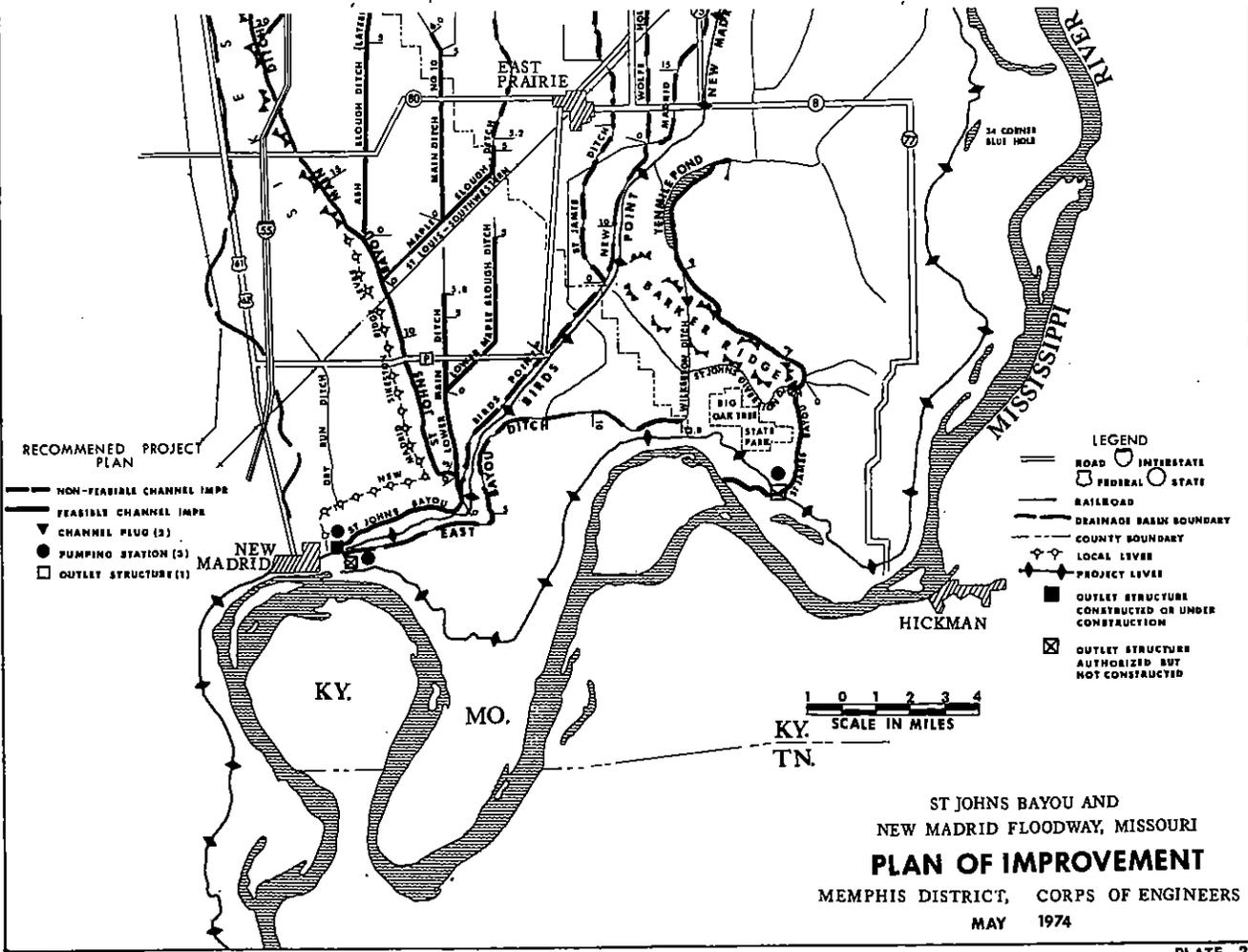
Due consideration has been given the subject correspondence.

The U. S. Army Corps of Engineers will comply with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800) when, as stated on pages 22 and 23 of this impact statement, thorough surveys and coordination with the State Historic Preservation Officer identify properties eligible for inclusion in the National Register which would be endangered by the project.



58

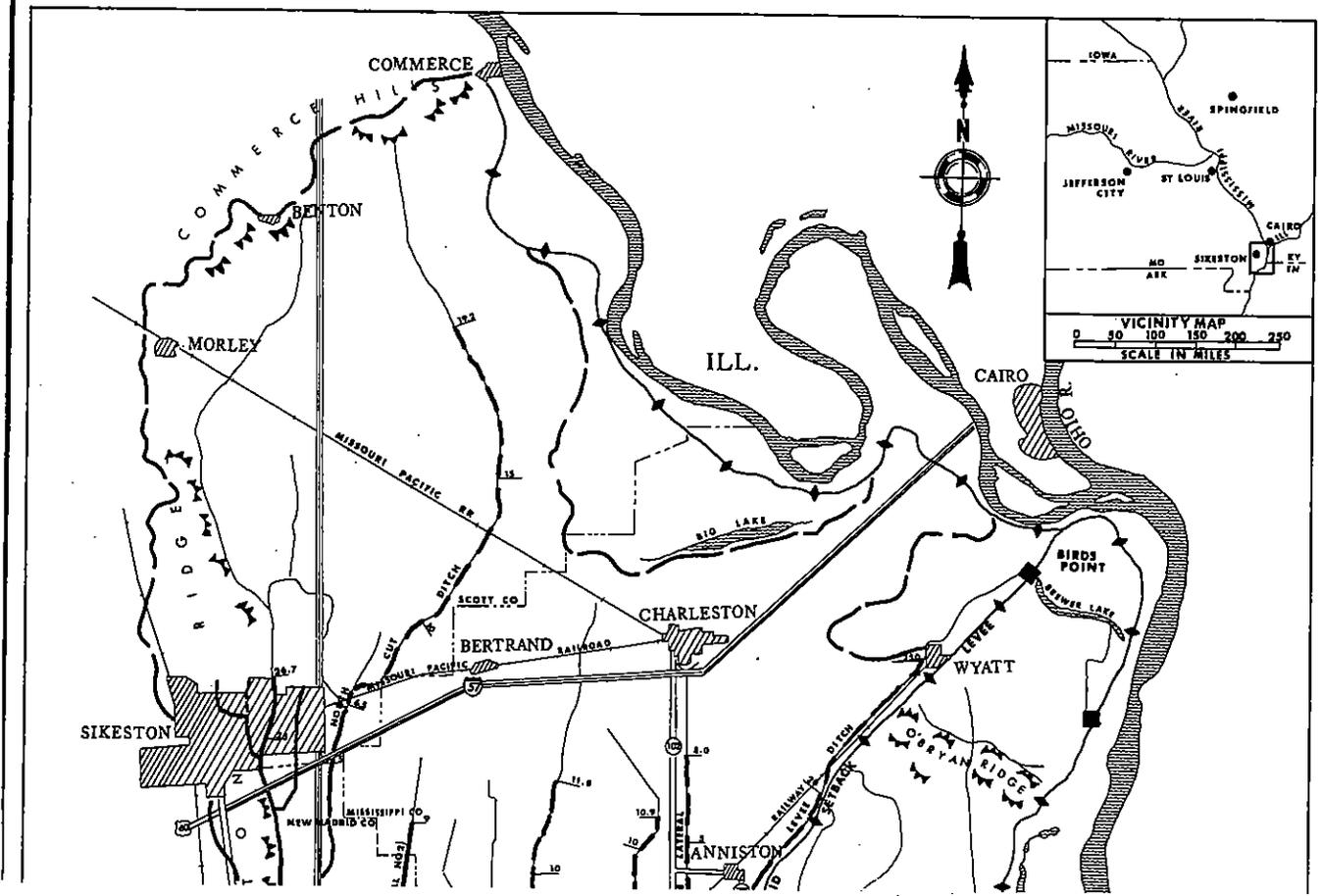


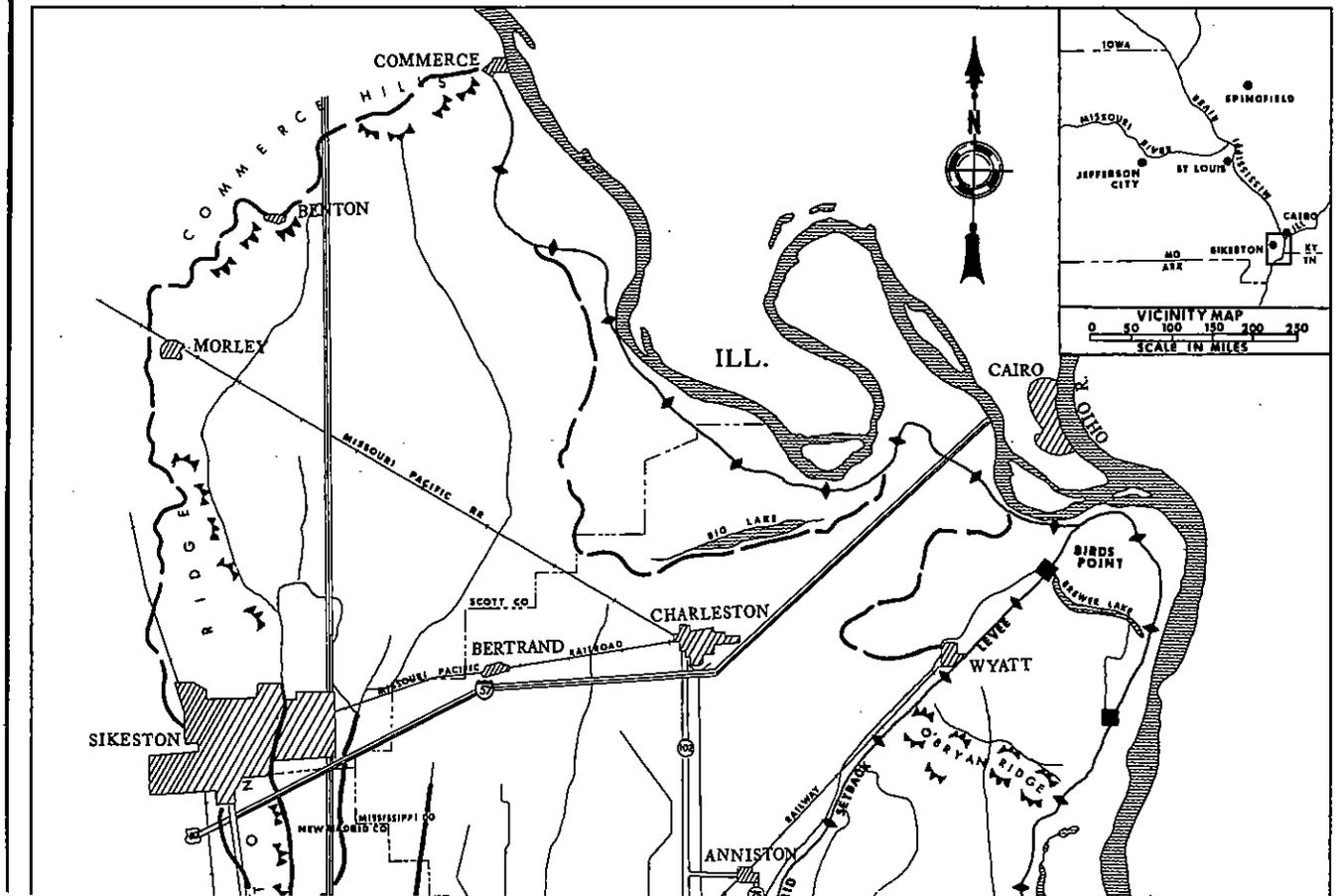


ST JOHNS BAYOU AND
 NEW MADRID FLOODWAY, MISSOURI
PLAN OF IMPROVEMENT

MEMPHIS DISTRICT, CORPS OF ENGINEERS
 MAY 1974

60





APPENDIX A

LETTERS RECEIVED BY THE DISTRICT ENGINEER
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT



United States Department of the Interior

OFFICE OF THE SECRETARY

MISSOURI BASIN REGION

IN REPLY REFER TO:
ER-74/480

BUILDING 67, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

JUN 5 1974

Dear Colonel Lehman:

In response to your letter of April 2, 1974, we have reviewed the draft environmental impact statement on St. Johns Bayou and New Madrid Floodway, Missouri. We offer these comments for your consideration.

General Comments

In general, the environmental impact statement accurately describes fish and wildlife resources of the project area, and most of the suggested fish and wildlife recommendations have been incorporated into the plans. There are very significant discrepancies in the project impact data provided the Bureau of Sport Fisheries and Wildlife for its evaluation and that which is contained in the environmental statement.

1. Project Description

The 11 or 12 square miles of land proposed for acquisition or flooding easements have not been delineated in the environmental statement. Consequently, the impact of these proposed actions cannot be considered to have been analyzed except in a general way. The alignment of 4 miles of proposed new channel east of Ten Mile Pond has been delineated at a scale as small as 1:325,000 (about 5 miles per inch). The proposed width, depth, and design of this new channel do not appear to have been mentioned, nor has the impact of this part of the proposal been discussed. The proposal to install two channel plugs near the Barker Ridge drainage divide (map, last plate) has apparently not been discussed in the text. Proposed bridge replacement in both the St. Johns Bayou area and the St. James Bayou area (Table 1, p. 2a) has not been discussed in the text and the location of this construction has not been shown on the map nor mentioned in the statement. Thus, we are unable to fully assess the impacts of these aspects of the project on the geologic environment of the areas.

2. Environmental Setting

Known mineral resources of the project area consist of clay and sand and gravel. An examination of library and file data, without benefit of field investigation, revealed that during 1971, mineral production in Scott County

65

Page 29 mentions that the impact of the project on environmental resources will be of much more subtle nature than dramatic impacts already incurred on the original ecosystem. Present channel widths will be approximately doubled (pages 24 and 44), 7,400 acres of trees and other vegetation will be cleared, which amounts to about a 79 percent reduction in existing vegetation (page 30), and the presence of pumping stations and spoil banks will be quite noticeable. These environmental impacts will be quite prominent and the adjective "subtle" seems inappropriate.

Page 33, paragraph 1, emphasizes the nonconsumptive recreational opportunities of mitigation lands; however, the loss of such recreational opportunities as bird watching and nature study resulting from the project are not thoroughly discussed. For example, habitat for approximately 30,000 songbirds and other birds^{1/} will be lost as a result of timber clearing operations. Over the life of the project and beyond, or until preproject conditions return to the affected areas, the number of songbirds and the non-game wildlife species thus eliminated would be tremendous. Since less than 2,500 acres of woodland habitat will remain after project construction, opportunities to significantly reduce this loss are quite limited. The final environmental statement should devote a more balanced discussion to the net impacts of the project on non-consumptive recreational opportunities.

In regard to the understanding of the Bureau of Sport Fisheries and Wildlife and the Missouri Department of Conservation, page 45 notes, ". . . both agencies are in agreement as to the adequacy of proposed mitigation measures if the project is constructed . . ." The fact that the Bureau of Sport Fisheries and Wildlife and the Missouri Department of Conservation recommendations concerning mitigation measures were based on inaccurate and very significantly lower acreage figures for wildlife habitat lost as a result of the project invalidates this statement. The Corps' failure to provide current and accurate project data on which to base mitigation recommendations and the ramifications thereof should be clearly pointed out and thoroughly discussed in the final statement.

5. Alternatives to the Proposed Action

Pages 25 and 34 mention that 2 miles of existing channel will be improved riverside of the St. James Bayou pumping plant and outlet structure, and that this will prevent degradation of an existing oxbow lake on Island No. 7. Recommendation 4 of the U. S. Fish and Wildlife Service report requested that, "A new channel and other structural features as may be necessary to prevent sediment and turbidity damages to fishing waters on

^{1/} The National Audubon Society (In Collaboration with the U. S. Fish and Wildlife Service), American Birds, Incorporating Audubon Field Notes, December 1974, Volume 27, Number 6.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
1735 BALTIMORE - ROOM 249
KANSAS CITY, MISSOURI 64108

June
March 4, 1974

Colonel A. Lehman
District Engineer
U.S. Army Corps of Engineers
668 Clifford Davis Federal Building
Memphis, Tennessee 38103

Dear Colonel Lehman:

We have reviewed the Draft Environmental Impact Statement for the St. Johns Bayou and New Madrid Floodway, Missouri. The project and environmental impact statement are rated ER-2 indicating we have environmental reservations because of the stated degradation in water quality. However, the final statement should also include additional information as discussed in the following paragraphs:

Water Quality

The statement declares the project will degrade the water quality of the channels during the life of the project, however, the statement does not provide data on the present or predicted water quality. The final statement should document the present water quality of the existing channels including, but not limited to, the following parameters: dissolved oxygen, biochemical oxygen demand; nutrient, pesticide, and sediment concentrations; pH and indicator bacterial counts. It should also identify the predicted changes in water quality including dissolved oxygen depletion due to agitation of organic material during channeling procedures.

The final statement should discuss the applicable state water quality standards and indicate if either construction or maintenance of the proposed project will violate the standards. The New Madrid Floodway has been designated by the Missouri Clean Water Commission as an effluent limited segment. An effluent limited segment is any segment of a stream where water quality is meeting and will continue to meet applicable water quality standards or where adequate demonstration indicates water quality will meet applicable water quality standards after application of the effluent limitations required by Section 301(b)(1)(A) and 301(b)(1)(B) of

The final statement should discuss the possibility of providing low water sills in the proposed channels to provide a pool type habitat for fish and other aquatic organisms during periods of low flow. It is our understanding that these sills would not hamper the discharge of flood waters but would allow the channels to maintain a fishery and therefore provide additional recreation for the residents in the area.

The discussion in the draft statement on ecology and ecosystems are incomplete and should be expanded to describe existing ecosystems and the effects of the proposed project on them. Except as modified by man's activities, ecosystems consist of the natural physical environmental features and the plant and animal organisms which depend on the physical environment and each other for life support.

There are reports available which discuss the effects on water quality caused by various physical modification of streams. The following reports provide information which should be studied prior to the formulation of the channelization project and their discussion or reference included in the impact statement.

Methods to predict the effects of channelization projects are included in a volume produced by the Soil Conservation Service entitled, "Planning and Design of Open Channels" (Tech. Release No. 25). Chapter 7 is a recently included chapter on environmental considerations.

The Council on Environmental Quality "Report On Channel Modifications," (A.D. Little, Inc., March, 1973), presents the results of extensive biological investigations conducted by the Philadelphia Academy of Natural Sciences. Chapter 5 of Volume I of this report entitled, "Effects of Channel Modifications on Fish and Wildlife Resources, Habitat, Species Diversity, and Productivity" directly addresses the biological effects observed in channelization projects.

We appreciate this opportunity to review and comment on the draft environmental impact statement. Please forward a copy of the final environmental impact statement to us when it is sent to the Council on Environmental Quality.

Very truly yours,

Edward C. Vest

Edward C. Vest
Environmental Impact Statement
Coordinator

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Washington, D. C. 20250

MAY 13 1974

Col. A. C. Lehman
District Engineer
Corps of Engineers
Department of the Army
668 Clifford Davis Federal Bldg.
Memphis, Tennessee 38103



Dear Col. Lehman:

We have reviewed the Draft Environmental Impact Statement for the St. Johns Bayou and New Madrid Floodway Project in Missouri.

The draft presents a fair appraisal of the expected impact of the proposal on forest land from the standpoint of esthetics, wildlife habitat, recreation and intangible amenities. It also describes the impact on water quality. It does not describe the loss of timber values which is expected to occur, and it is our understanding that the area contains valuable bottomland hardwood sites.

Benefit determinations for this project draw heavily upon enhancement values which would result from conversion of low annual income from producing forest land to higher annual income from pasture and row crops.

Since forest land is considerably impacted by the project, we are concerned that the statement provides little information regarding present and potential forest resource values. This is information that had to be available for project cost, benefit determinations, and which should be fully expressed in the environmental statement.

Alternatives to the proposed action could be expanded to include consideration of the use of bottomland forested areas for temporary floodwater storage. Such areas, outside levee protected zones, could hold significant amounts of floodwater for short periods of time. It would seem possible that the amount of storage involved could result in benefits of flood damage reductions and reduced levee construction costs. At the same time, these bottomland areas could be managed to increase timber and environmental values; expanding multiple land use (flood control, timber, wildlife, esthetics, etc.) rather than reducing them to a single open land agricultural use.



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
AREA OFFICE
210 NORTH 12TH. STREET, ST. LOUIS, MISSOURI 63101

AREA OFFICES
Kansas City, Kansas
Omaha, Nebraska
St. Louis, Missouri

REGION VII
REGIONAL OFFICE
KANSAS CITY, MISSOURI

May 24, 1974

IN REPLY REFER TO:
7.3PP

Colonel A. C. Lehman
Corps of Engineers
Memphis District
668 Clifford David Federal Building
Memphis, Tennessee 38103

Dear Colonel Lehman:

Subject: Draft Environmental Impact Statement for the St. John's Bayou and New Madrid Floodway Project in Missouri

Reference is made to your letter of April 2, 1974 requesting comments on the Draft Environmental Impact Statement for the St. John's Bayou and New Madrid Floodway Project in Missouri. The letter and Draft Environmental Statement has been forwarded to this office for review and comment.

From the information and data contained in the draft statement, it appears that not all aspects of the environmental quality have been realistically assessed. The statement does not provide adequate inventories nor does it thoroughly assess the present status of knowledge concerning all naturalistic and human resources effected. Due to these general areas of concern, we offer you these remarks for your consideration.

Upon completing the review of the Draft Statement, it is frightening to see that extensive wilderness areas are disappearing and more drainage and water areas are being mapped for short-term human exploitation. In the entire history of the great Mississippi Valley, this dominance by a single form of life is unprecedented. There is no doubt that man and his engineering knowledge has won his way by securing a foothold in the Mississippi River Basin ecosystem by threatening the position of all creature competitors. It now appears that naturalistic features and their supporting areas can only survive on our sufferance.

The Draft Statement does encourage the purchase of approximately 2,500 acres for fish and wildlife management, but to support this small trade-off there must be a concentrated effort from the very beginning of this project proposal to recognize that all naturalistic species have claims upon man, natural rights which we should learn to respect. However, this would require a deep fundamental change of attitude toward all created things. Irregardless, there is a definite need to understand the depth of the change required from this project and this must be reflected throughout the Impact Statement.

We also feel that more details on Flood Insurance and the impact of the new law should be explained in the Draft Statement. The Flood Disaster Protection Act of 1973, passed by Congress late last year and signed by the President on December 31, 1973, will have a major impact on many communities in your project area. This act requires that communities having a high flood potential join the program or forfeit Federal financial assistance. The purpose of the law is: (a) to protect flood victims by assuring the availability of reasonably priced flood insurance, and (b) to minimize future flood damage by controlling development in areas subject to flooding. In accomplishing the latter, HUD and the Federal Government have been given a key role in land use decision making in communities applying for flood insurance.

All communities within your project area have been contacted and informed by the Bootheel Regional Planning Commission that they contain one or more "flood risk" areas. Flood risk under the legislation is defined as a one percent chance of flooding in any given year, i.e., a probability of a flood once every 100 years. Each community in the St. John's Bayou and New Madrid Floodway drainage areas have been asked to apply for admission to the flood insurance program after adopting regulations containing a building permit system. Those who do not join the program by July 1, 1975, will find land development and other real estate activity in the flood areas cut off from most sources of financial assistance. The ultimate purpose of the Flood Disaster Protection Act is to assure that a larger proportion of the flood loss costs will be covered in the future by insurance rather than by the use of public funds.

We feel that the National Flood Insurance Program can promote the public interest by providing appropriate protection against the perils of flood losses and at the same time encourage sound land use by minimizing exposure of property to flood losses. The program is a cooperative effort between the Federal Government and the private insurance industry, which is represented by the National Flood Insurers Association. Special questions relating to the program should be addressed to the Federal Insurance Administration, U. S. Department of Housing and Urban Development, 451 Seventh Street, S.W., Washington, D.C. 20410.

Your draft statement also emphasizes the traditional interpretation of floodplain zoning but fails to stress that this is a positive land use implementation feature. While floodplain zoning regulations might appear restrictive, their purpose is to promote more convenient, healthful, orderly, and attractive communities. Floodplain zoning is a means of regulation of land subject to flood by placing it in a separate district with certain restrictive use provisions so that flood damage can be minimized. Secondary benefits obviously accrue through the consequent protection of the health and general welfare of the community, but the main purpose is to reduce flood damage. When the draft statement discusses the freedom of choice of landowners and usurping of their vested interest by floodplain zoning, it

U. S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION SEVEN

P. O. Box 7186 - Country Club Station
Kansas City, Missouri 64113

A. C. Lehman, District Engineer
Colonel, Corps of Engineers
Memphis District, Corps of Engineers
668, Clifford Davis Federal Building
Memphis, Tennessee 38103

April 24, 1974

IN REPLY REFER TO:

Dear Colonel Lehman:

07-00-ED

Our review of the Corps' Draft Environmental Impact Statement covering the St. Johns Bayou and New Madrid Floodway project in Missouri has been coordinated with our Secretarial Representative. The review and coordination has developed the following comments:

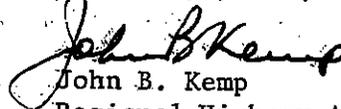
1. It is stated on page 30 that the project will affect the extent, duration, and heights of floods in a manner to prevent flooding of roads which, under present conditions, frequently occurs in some areas. To provide a base from which to adequately determine the effect upon public convenience and safety, the railroads, roads, and highways which will be flood protected as a result of the project, should be identified. Within the project area, there are two interstate highways; state, federal, and county highways; two railroads; and numerous city streets.

2. There is no indication as to whether existing highway and railroad crossings of existing channels will be adequate to accommodate the proposed channel widening and channel changes.

3. As a part of item 2 above, will any new crossings of channels be necessary?

We appreciate the opportunity to review and comment on this Draft Statement and look forward to receiving the Final.

Sincerely yours,



John B. Kemp
Regional Highway Administrator

**Advisory Council
On Historic Preservation**

1100 K Street N.W. Suite 430
Washington D.C. 20005

May 6, 1974

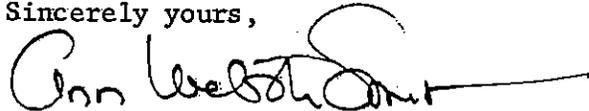
Col. A.C. Lehman
District Engineer
Memphis District
Corps of Engineers
U.S. Department of the Army
668 Clifford Davis Federal Building
Memphis, Tennessee 38103

Dear Colonel Lehman:

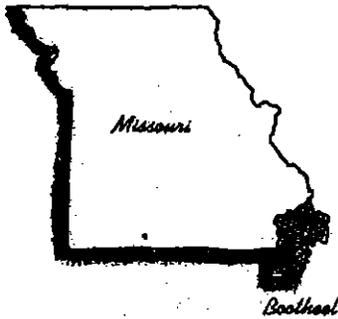
This is in response to your request of April 2, 1974, for comments on the environmental statement for the proposed St. Johns Bayou and New Madrid Floodway Project, Missouri. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your draft environmental statement appears adequate regarding our area of expertise and we have no further comment to make.

The Council appreciates your investigation of the possible effects of this proposed undertaking upon the area's cultural resources.

Sincerely yours,



Ann Webster Smith
Director, Office of Compliance



Bootheel Regional Planning Commission & Economic Development Council

P.O. Box 397

Telephone 314 276-2242

Malden, Missouri 63863

PAT LEA, CHAIRMAN
PHILIP SHELTON, DIRECTOR

May 2, 1974

Colonel A.C. Lehman
District Engineer
Memphis District, Corps of Engineers
668 Clifford Davis Federal Building
Memphis, Tenn. 38103

Dear Colonel Lehman:

The Bootheel's A-95 PNRS Committee and the Bootheel Regional Planning Commission have reviewed and approved the St. Johns Bayou and New Madrid Floodway Plan dated January 1974. Members of the commission staff and commission members attended the public hearings conducted by the Memphis Corps of Engineers in Mississippi County on April 17, 1974 and in Sikeston on April 18, 1974.

Extreme interest has been expressed by the local people in the development of the 10 Mile Pond project, which is included in this plan. The Bootheel Regional Planning Commission would appreciate receiving any information which the Memphis Corps of Engineers could provide concerning the progress of this particular element, once the total project is initiated.

Sincerely,

Ronald C. Yersak
Planning Director

RCY:gw

cc: Mr. Terry Rehma
Mr. Philip Shelton

"Be Regionable"



MISSOURI DEPARTMENT OF CONSERVATION

2901 North Ten Mile Drive - Jefferson City, Missouri 65101

P. O. Box 180 - Telephone 314 751 4115

CARL R. NOREN, Director

April 25, 1974

Mr. Terry Rehma
Department of Community Affairs
505 Missouri Boulevard
Jefferson City, Missouri 65101

Re: 74040024 - St. Johns Bayou-New
Madrid Floodway, Missouri

Dear Mr. Rehma:

The draft Environmental Impact Statement for this project appears to fairly state the case for the project area as the Corps of Engineers project recommendations now stand. Based on our knowledge of the area and its fish, wildlife and forest resources, the following items should be corrected or clarified:

Page 19 - Fish, Sport and Commercial

The reference to commercial fishing is misleading since in Missouri in the project locality, it is legal only in the Mississippi River.

Page 26 - Paragraph 1 - There is some feeling that local drainage has and will continue to affect the Big Oak Tree State Park timber stands. We are not certain that the actual effects have been studied and documented.

Page 27 - Botanical Resources

Page 43 - Biological Impacts

Page 51 - Line 1 and 2

Information supplied by the Memphis District Corps of Engineers to the Bureau of Sport Fisheries and Wildlife, Vicksburg, Mississippi indicated that there will be considerably less than the reported 7,000 acres of forest land conversion to agricultural purposes as a result of the project. The lower Corps of Engineers supplied figures were used in the Fish and Wildlife studies.

COMMISSION

JIM TOM BLAIR
St. Louis

ROBERT G. DELANEY
Charleston

HARRY MILLS
Clinton

G. ANDY RUNGE
Mexico

75

JACK CURTIS, *Chairman*
750 N. Jefferson
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701 Davis
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ROGER R. LINSIN, *Member*
5841 Hamilton
St. Louis 63136

W. R. LOGAN, *Member*
Sitex 63377

LYNN W. BAUER, *Member*
2201 Grand Avenue
Kansas City 64108

DANIEL W. DUNCAN, *Member*
2801 South Second St.
St. Joseph 64503

MISSOURI
STATE HIGHWAY COMMISSION



ROBERT N. HUNTER, *Chief Engineer*

BRUCE A. RING, *Chief Counsel*

L. V. McLAUGHLIN, *Asst. Chief Engineer*

MRS. IRENE WOLLENBERG, *Secretary*

Jefferson City, Missouri 65101
Telephone (314) 751-2551

April 18, 1974

GENERAL: A-95 Review
Application No. 74040024

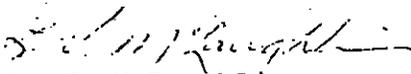
Mr. Terry Rehma
State Clearinghouse Coordinator
Department of Community Affairs
Office of Planning
505 Missouri Boulevard
Jefferson City, Missouri 65101

Dear Mr. Rehma:

The Draft Environmental Impact Statement covering the St. Johns Bayou and New Madrid Floodway project will affect 20 locations on the State Highway System, including, among other effects, 20 single bridges, 3 dual Interstate bridges, 1 dual Primary bridge, 1 metal arch pipe culvert, 2 new bridge locations, and an undetermined involvement at the pumping station on Route WW in New Madrid County.

No mention is made in the Environmental Assessment about the impact on the State Highway System and the proposed channel improvement will adversely affect existing bridge structures because of the necessity for extending or replacing. Although our working relationship with the Corps of Engineers should guarantee no adverse effects to the State Highway System, we feel that the Environmental Assessment should be expanded to include such obligations.

Very truly yours,


L. V. McLaughlin
Assistant Chief Engineer -
A-95 Review Agent

Colonel A. C. Lehman
May 1, 1974
Page 2

- (b) Included on the National Register of Historic Places are the following archaeological and historical sites:
 - (1) Swank, Jacob, House
 - (2) Missouri Pacific Depot at Charleston
 - (3) Crosno Fortified Village Archaeological Site
 - (4) Towosahgy State Park and Archaeological Site (Beckwith's Fort)
 - (5) Sandy Woods Settlement
 - (6) E. L. Brown Village and Mound Archaeological Site
 - (7) Mound Cemetery (Lilbourn Fortified Village Archaeological Site)
 - (8) Hoecake Village Archaeological Site
 - (9) O'Bryan Ridge Archaeological District
 - (10) Hearn's Site
 - (11) Hurricane Ridge Site
 - (12) Sikeston Fortified Village Archaeological Site
- (c) Pending acceptance in Washington, D. C., to the National Register of Historic Places are the following sites:
 - (1) Hess Archaeological Site
 - (2) Mueller Archaeological Site
 - (3) LaPlant Archaeological Site
- (d) The following sites are being prepared for nomination:
 - (1) King Archaeological Site
 - (2) St. John's Archaeological Site
 - (3) New Madrid Historical District

2. Page 22 - Archaeological and Historical Elements

- (a) Lines 3-4 - "...Mississippian Indian settlements..." is too limiting. The term "Mississippian" should be changed to "aboriginal" or "prehistoric" settlements.
- (b) Lines 8-9 - "...New Madrid as the oldest American city west of the Mississippi River." Although this city was the earliest settlement by Americans, it is not the oldest city west of the Mississippi River. Ste. Genevieve was settled in 1735 and St. Louis in 1763. As now stated, it is misleading, and the sentence should be reworded to prevent misunderstanding.

3. Page 33 - Archaeological Impacts

- (a) The Mueller Archaeological Site appears to be in close proximity to the project and may be affected by it. The site's location is marked on the U.S.G.S. map for your coordination.
- (b) We applaud your commitment to the National Park Service's recommendations for an archaeological, historical, and architectural survey of the area and strongly urge that this survey be made prior to any ground disruption activities. This office would be interested in knowing who has been selected to do the survey work. We will be happy to cooperate with your agency or the surveyor in mitigating any adverse effects on Missouri's cultural resources.

THE STATE



OF MISSOURI

Water Resources Board

Executive Director

308 East High Street
JEFFERSON CITY, MISSOURI 65101

May 3, 1974

P. O. Box 271
Telephone
(314) 751-4252

Mr. Terry Rehma
A-95 Clearinghouse Coordinator
Department of Community Affairs
505 Missouri Blvd.
Jefferson City, Missouri 65101

Dear Terry;

This is in reference to the Environmental Impact Statement on St. Johns Bayou and New Madrid Floodway in Missouri.

Under paragraph 3 of the Introduction, line 10 states that the aquatic resources will be permanently degraded in the altered ditches although these impacts will become less severe as the channels become restabilized. The wording of this could perhaps be changed to reflect a cycle of restabilization and give consideration to the total potential resources and that the blanket statement implying that all resources will be permanently degraded may seem a little strong.

It would appear that the project generally satisfies the needs and desires of the people interested in it.

Sincerely,

Charles P. Michael
Charles P. Michael
Research Analyst

CPM:rjk

Chairman
HAYSLER A. POAGUE
Clinton

GEORGE E. SMITH
424 Clark Hall
Columbia

EARL R. SCHULTZ
1512 Kurre Lane
Cape Girardeau

Vice-Chairman
JOSEPH R. SNYDER
Gallatin

VANCE C. LISCHER
Route 2
Cook Station

cultivation. The draft EIS states that 95 percent of the two basins have already been converted from woodlands to agricultural production and notes that an additional 7,200 acres of woodlands would be cleared under the project. The result would be that the basins would be 99 percent clear of woodlands. The forestry incentive provisions of the aforementioned Act provide up to 75 percent Federal grants for forest restoration on private lands. If the 7,200 acres which would be cleared under the project were already in agricultural use, they could qualify for Federal tree planing assistance, which could amount to over \$500,000, based on an estimated planting cost of \$95 per acre. We submit that tax dollars spent by the Corps of Engineers to enable the deforestation of private lands makes no sense in light of the nation's documented growing need for increased forest products. The thrust of such action would be exactly opposite to the congressional goals outlined in the Agricultural Consumer Protection Act.

(4) Development of this project would destroy valuable sport fishing resources. According to biologists of the Missouri Department of Conservation, the St. Johns Ditch in southeast Missouri produces the best sport fishing of any stream in the entire area. Page 11 of the draft EIS states that "sport fishing pressure is high with practically no commercial fishing in the area." The draft EIS notes, further, under Biological Impacts, "sport fishing will be reduced from an estimated 13,500 annual trips to 7,000 annual trips if the 1.1-year plan is implemented; and 6,200 trips, if the 10-year plan is implemented." Such a reduction is not justified and cannot be tolerated.

(5) Construction and operation of the project would require a major expenditure of energy. In addition to the very substantial amount of heavy equipment work involved in widening and clearing the ditches and in removal of the woodlands, the project would require the establishment of three pumping stations with a capacity of 3,000 cubic feet/ per second. At this time of great national shortage of petroleum resources, the energy requirement of the project, itself, and the subsequent fuel consumption by pumping stations would impose an additional, unnecessary, wasteful, drain on diminishing petroleum supplies.

(6) Completion of the project would have little effect on industrial expansion. Page 17 of the draft EIS reports that "existing developments within the flood plains suffer frequent damage." Although the draft statement speculates that the completed project would increase land values and tax revenues, it concludes: "However, additional industrial development on flood plain lands will remain infeasible."

(7) The St. Johns Bayou and New Madrid Floodway project cannot survive examination under the Two-Objective System for Evaluating Proposed Water Development Projects. In October of 1973, President Nixon approved an enlightened two-objective system of water development project evaluation. In implementing his executive order, he directed that henceforth all such projects must give equal consideration to impact upon environmental quality, as well as to economic desirability. If the Corps will review this project under the "two-objective" philosophy, we believe it will fall far short of qualifying.

(8) We suggest a new alternative. The project alternatives outlined in the draft EIS include: (a) complete abandonment; (b) alternative structural changes to the drainage channels; and (c) non-structural measures. There is much to be said for controlling floods through non-structural measures which involve land-use planning in the entire watershed and include effective flood-plain zoning. This approach can be made to work in

APPENDIX B

LETTERS RECEIVED BY THE CHIEF OF ENGINEERS
ON THE
REVISED DRAFT ENVIRONMENTAL IMPACT STATEMENT



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER-75/136

20 May 1975

Dear General Gribble:

Thank you for your letter of February 7, 1975, requesting our views and comments on the Chief of Engineers' Report and supplemental papers on the St. Johns Bayou and New Madrid Floodway, New Madrid, Scott, and Mississippi Counties, Missouri. We believe that the documents provide adequate consideration for fish and wildlife protection and also adequately cover the concerns of outdoor recreation.

In our earlier review of the draft statement, we indicated to the Corps our concern about a sand and gravel operation in the eastern portion of the City of Sikeston, Missouri. The Corps subsequently assured us that the project would have no adverse effect on this facility. Therefore, we have no objections to the revised statement as it relates to mineral resources.

It is stated in the environmental summary that "no known historical or archeological sites will be destroyed by the project" and it is stated in the impact section that none of the archeological sites included on the National Register of Historic Places will be directly affected by this project. A similar evaluation of effects on the historic sites listed on page 15 should be provided. The date of the National Historic Preservation Act is 1966, not 1955, as cited on page 15.

Archeological surveys to be made should include all project features (pumping stations; sump areas; channel enlargement, clean-out, improvement, and construction; outlet structures; areas to be covered by spoil and berms; and lands to be purchased for wildlife mitigation).



Save Energy and You Serve America!

The final statement should also present procedures to be implemented in the event that previously unknown cultural resources are encountered during project construction.

We hope these comments will be of assistance to you in preparing your final documents.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Stanley D. Doremus". The signature is written in a cursive style with a large, prominent initial "S".

Deputy Assistant Secretary of the Interior

W. C. Gribble, Jr.
Lieutenant General, USA
Chief of Engineers
Corps of Engineers
Department of the Army
Washington, D. C. 20314



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
1735 BALTIMORE - ROOM 249
KANSAS CITY, MISSOURI 64108

March 20, 1975

Colonel A. Lehman
District Engineer
U.S. Army Corps of Engineers
668 Clifford Davis Federal Building
Memphis, Tennessee 38103

Dear Colonel Lehman:

Re: St. James Bayou and New Madrid Floodway, Missouri

We have reviewed the Draft Environmental Impact Statement for the referenced project. This is the second draft statement prepared for the project. Although our review of the original statement indicated the Environmental Protection Agency had environmental reservations with several aspects of the project, we believe our concerns are adequately resolved in the revised draft. Therefore, we are rating this draft statement LO-1. The rating indicates we have a lack of objection to the project as proposed and the statement has provided sufficient information to assess the probable impacts of the action and the incorporated measures to minimize these probable impacts.

We appreciate this opportunity to review and comment on the draft statement. Please furnish two copies of the final to us when it is filed with the Council on Environmental Quality.

Very truly yours,

Edward C. Vest

Edward C. Vest
Environmental Impact Statement
Coordinator

The final statement should also present procedures to be implemented in the event that previously unknown cultural resources are encountered during project construction.

We hope these comments will be of assistance to you in preparing your final documents.

Sincerely yours,



Deputy Assistant Secretary of the Interior

W. C. Gribble, Jr.
Lieutenant General, USA
Chief of Engineers
Corps of Engineers
Department of the Army
Washington, D. C. 20314

U. S. DEPARTMENT OF AGRICULTURE

Comments on Report and Draft Environmental Impact Statement

St. Johns Bayou and New Madrid Floodway, Missouri

1. The draft environmental impact statement (EIS) indicates that there are presently about 9,300 acres of woodland in the study area. On page 46 of the EIS, it is noted that with specified mitigation features, the project will induce clearing of 3,980 acres for cropland and 200 acres for channel work. This is a significant reduction of an already scarce resource and probably should be discussed in more detail in the report and EIS.

A discussion of the distribution and ownership of the woodlands would be helpful in understanding the present and potential use of these areas for esthetics, wildlife habitat, recreation, and timber production. A more specific discussion of the adverse effects of additional clearing could be helpful in discouraging this practice on a massive scale.

2. Since soybeans make up almost two-thirds of the cropland in the project area, soybean yields could have a large impact on benefit calculations. The flood-free yields listed in Table C-3 of the report range from 40 to 72 bushels and appear to be high. Table 13, on page 50 of the publication cited as the source of data, gives average yields by soil productivity groups for Missouri ranging from 18 to 35 bushels for 1970 and from 33 to 64 bushels in 2020. Table C-14 indicates a 7 bushel increase in soybean yields due to the project which appears realistic. Thus, the benefits claimed for the project may be accurate but you may wish to verify the actual yield figures.
3. The report and draft EIS indicate a 6-7/8 percent interest rate was used. The applicable rate for fiscal year 1975 is 5-7/8 percent.
4. On page C-3, paragraph 1, line 4 - Change Missouri State Conservationist to "Soil Conservation Service."



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

• 15 April 1975

• Lieutenant General W. C. Gribble, Jr.
Chief of Engineers
Department of the Army
Washington, D. C. 20314

Dear General Gribble:

This is in response to your letter of 7 February 1975 addressed to Mr. Claude S. Brinegar concerning your proposed report on St. John's Bayou and New Madrid Floodway, New Madrid, Scott and Mississippi Counties, Missouri.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Federal Highway Administration stated that their regional administration had responded to a query from the Corps of Engineers. However, a copy of this reply has not been furnished the Federal Highway Administration Washington office. We have no comments to offer in addition to those submitted by the Federal Highway Administration regional office.

Sincerely,

W. E. Caldwell

W. E. CALDWELL
Captain, U.S. Coast Guard
Deputy Chief, Office of Marine
Environment and Systems
By direction of the Commandant



EXECUTIVE OFFICE
STATE OF MISSOURI
JEFFERSON CITY

CHRISTOPHER S. BOND
GOVERNOR

March 27, 1975

Lieutenant General William C. Gribble, Jr.
Chief of Engineers
Department of the Army
Washington, D. C. 20314

Dear General Gribble:

The State of Missouri has reviewed the St. Johns Bayou and New Madrid Floodway project Draft Environmental Impact Statement (May, 1974) and the Review Report prepared by the District Engineer.

The prospect for improved flood protection and drainage in rural and urban areas of southeast Missouri is encouraging. Our optimistic outlook is based on our review and recognition of agreements previously reached with several interests in the areas of mitigation and future management of the fisheries, wildlife and forest resources, public use, and coordination of plans with the sponsors of the Mississippi County Spillway Watershed project.

We recommend that a change be made on page H-6 of the Review Report to reflect the fact that the City of New Madrid has been a participant in the National Flood Insurance Program since December 11, 1973.

James L. Wilson, the Missouri State Historic Preservation Officer, will provide you with separate comments with respect to the archaeological, historical, and architectural resources.

The State of Missouri approves the St. Johns Bayou and New Madrid Floodway project and encourages that steps be taken to expedite the funding of the project.

Sincerely
Christopher S. Bond
GOVERNOR

CSB:etm

Lieutenant General William C. Gribble, Jr.
March 26, 1975
Page 2

3. page 39 - Archaeological Impacts (Without Mitigation)

Lines 1-2 - "...The potential for damaging sites as a direct result of project construction appears minimal." The St. John's Archaeological Site, which is being considered for nomination to the National Register of Historic Places, is located at the junction of St. John's Diversion Ditch and St. James Bayou and appears to be in the direct impact area. Any adverse effects to this site must be mitigated.

4. page 60 - Archaeological Impacts

Lines 1-3 - "...None of the archaeological sites included on the National Register of Historic Places will be disturbed by either of the alternatives." The St. John's Archaeological Site, which is being considered for nomination to the National Register of Historic Places, may be affected. See comment 3.

5. Coordination with Others

(a) page 96 - Advisory Council on Historic Preservation

This is misleading because only the May 6, 1974, comment is included. The June 17, 1974, comments which supersede the May 6, 1974 comments are excluded. See comment 7. Enclosed is a copy of the June 17, 1974 correspondence.

(b) page 103-104 - Missouri State Park Board

The comments on these two pages were for the State Historic Preservation Officer by the State Historical Survey and Planning Office, which, at the time the comments were made, was a subdivision of the Missouri State Park Board. The State Historical Survey and Planning Office is now a Program within the Division of Policy and Planning Development, Missouri Department of Natural Resources. The Missouri State Park Board is now an advisory body and staff responsibilities for the park system are housed in the Division of Parks and Recreation, Department of Natural Resources. Surveys of archaeological or historical resources associated with this project should be coordinated with the State Historic Preservation Officer rather than with a particular agency.

6. Comments Requested but not Received

page 111 - Comments were received from the State Historical Survey and Planning Office. See comment 6 (b).

Advisory Council
On Historic Preservation
1522 K Street N.W. Suite 430
Washington D.C. 20005

JUN 17 1974

Colonel A. C. Lehman
District Engineer
Memphis District, Corps of Engineers
U.S. Department of the Army
668 Clifford Davis Federal Building
Memphis, Tennessee 38103

Dear Colonel Lehman:

On May 6, 1974, the Advisory Council responded to your request for comments on the Draft Environmental Statement (DES) for the proposed St. Johns Bayou and New Madrid Floodway Project in Missouri. At that time, the Council stated that the DES was adequate regarding our area of expertise. However, it has recently been brought to our attention that page 46, on which there appears a discussion of the project's impact on archeological resources, is missing from the copy used in our review.

Subsequent discussions with the staff of the Missouri State Historic Preservation Officer (SHPO) revealed that the undertaking may result in adverse effects upon cultural resources which may be eligible for inclusion in the National Register of Historic Places. Therefore, the Council requests that the Corps of Engineers furnish us with an assurance that the Corps will comply with the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), if the results of the archeological surveys and subsequent consultations with the SHPO, alluded to on pages 33 and 34, identify properties eligible for inclusion in the National Register

Your continued cooperation is appreciated.

Sincerely yours,



Ann Webster Smith
Director, Office of Compliance

ATTACHMENT 1

ATTACHMENT I

Summary Economic Information Submitted with
Environmental Statements

	Rural Flood Damages Prevented \$	Increased Land Utilization \$	Advanced Bridge Replacement \$	Redevelop- ment \$	Urban Flood Damages Prevented \$	Total Annual Benefits \$	Total Annual Charges \$	Benefit- Cost Ratio
<u>FLOOD CONTROL FEATURES</u>								
St. Johns Bayou Area	733,900	1,330,700	32,400	81,400	7,300	2,185,700	899,600	2.4
Sikeston	-	-	-	-	33,200	33,200	21,100	1.6
Lower New Madrid Floodway Area	194,300	309,600	-	12,200	-	516,100	141,600	3.6
St. James Bayou Area	204,000	479,000	10,600	58,900	-	752,500	428,400	1.8
SUBTOTAL	1,132,200	2,119,300	43,000	152,500	40,500	3,487,500	1,490,700	2.3
<u>FISH & WILDLIFE MITIGATION</u>	-	-	-	-	-	1/	122,600	
TOTAL	1,132,200	2,119,300	43,000	152,500	40,500	3,487,500	1,613,300	2.2

1/ Mitigation features are designed to offset fish and wildlife losses and do not provide benefits in excess of costs

STATEMENT OF FINDINGS
ST. JOHNS BAYOU AND NEW MADRID FLOODWAY, MISSOURI

1. As District Engineer, Memphis District, U. S. Army Corps of Engineers, I have reviewed and evaluated, in light of the overall public interest, the documents concerning the proposed action, as well as the stated views of other interested agencies and the concerned public, relative to the various practicable alternatives in accomplishing a reduction in flood damages in the St. Johns Bayou and New Madrid Floodway, Missouri, area.

2. The possible consequences of these alternatives have been studied for social well-being and for environmental, cultural, and economic effects, including regional and national economic development and feasibility.

3. In evaluation of the selected and other viable alternatives, the following points were considered pertinent:

a. Environmental Considerations. Adoption of the recommended plan will have both favorable and unfavorable environmental impacts. On the favorable side, the works will: permit the management of water on approximately 2,500 acres of lands for fish and wildlife use, provide access for migratory waterfowl hunting on approximately 4,900 acres of lands, permit continued public access on numerous borrow pits and blue holes for fisheries resources, reduce the extent and duration of flooding on area lands, reduce the disruption of private lives and public services due to flooding, and reduce health hazards due to flooding. On the unfavorable side, the works will: encourage the clearing for agriculture lands which are now undeveloped; create a temporary, unsightly condition of berms and spoil banks denuded of vegetation, adversely affect the already degraded fish population in channels, temporarily destroy much of the existing subaqueous growth, increase water turbidity for inbank flows during and shortly following construction; and inevitably change the biotic community on all lands affected by altered flow conditions.

The adverse environmental impacts appear minimal in comparison to the biological disruption already experienced as a result of increased agricultural development throughout the basin, accelerated runoff, and channelization by local interests. All favorable and unfavorable environmental impacts were considered, and it is my conclusion that the trade-offs associated with the recommended plan are both reasonable and acceptable.

b. Social and Economic Consideration. The St. Johns Bayou and New Madrid Floodway area is predominantly rural in character, with an agricultural economic base. From a regional viewpoint, Federal funds expended within the area will stimulate economic activity by generating additional job opportunities.

The recommended project, at an estimated cost of \$21,966,000, provides the maximum excess of benefits over costs of all alternative plans considered. With construction of the project features recommended, average annual losses will be reduced from \$1,581,900 to \$409,200 for an economic benefit of \$1,172,700.

c. Engineering. The nature of the problem and physical characteristics of the area provide for consideration of several alternative solutions to the flood problem. An analysis of the flooding problem revealed that nonstructural alternatives would not reduce crop and non-crop damages and would thus not achieve the desired objectives.

Those project features considered to reduce flood damages were: (1) various plans of channel improvement, (2) construction of an outlet structure, and (3) construction of pumping stations at various sites. These features were considered both singularly and in combination. The recommended plan was chosen because it affords an excess of benefits over costs, provides a reasonable degree of flood protection, and provides for fish and wildlife preservation through a coordinated environmental plan.

4. I find that the action, as proposed in my recommendation, is based on thorough analysis and evaluation of various practicable alternative courses of action for achieving the stated objectives; that wherever adverse effects are found to be involved they cannot be avoided by following reasonable alternative courses of action which would achieve the Congressionally specified purposes; that where the proposed action has an adverse effect, this effect is either ameliorated or substantially outweighed by other action; is consonant with national policy, statutes, and administrative directives; and that on balance the total public interest should best be served by the implementation of the recommendation.

31 May 1974
(date)


A. C. LEHMAN
Colonel, Corps of Engineers
District Engineer

I concur in the preceding statement of findings.

27 July 1974
(date)


CHARLES C. NOBLE
Major General, USA
President, Mississippi River Commission

I concur in the preceding statement of findings.

19 Sep 1975

DATE

Kenneth E. McIntyre
KENNETH E. McINTYRE
Brigadier General, USA
Acting Director of Civil Works