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KASKASKIA ISLAND DRAINAGE AND LEVEE DISTRICT, ILLINOIS.(U)
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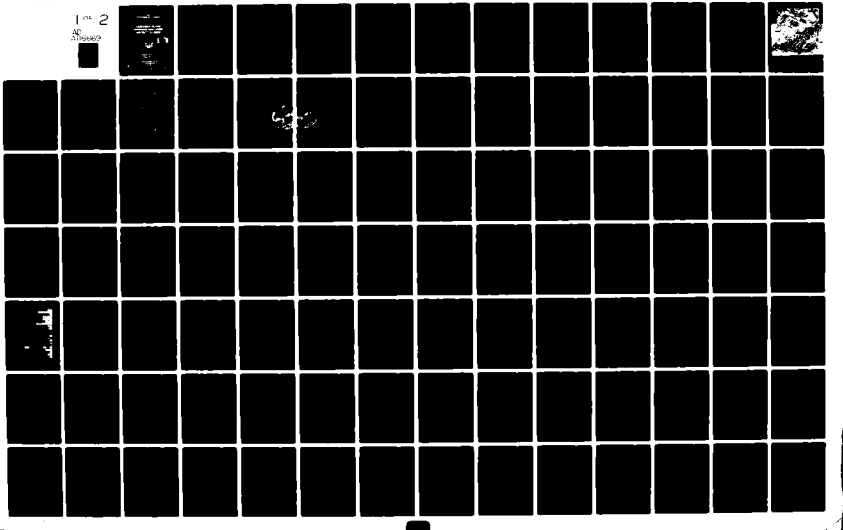

AD A116669

FINAL
ENVIRONMENTAL STATEMENT

KASKASKIA ISLAND DRAINAGE AND LEVEE DISTRICT, ILLINOIS

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER	2. GOVT ACCESSION NO. AD-A116 667	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* Kaskaskia Island Drainage and Levee District Illinois Final Environmental Impact Statement		5. TYPE OF REPORT & PERIOD COVERED Final 6. PERFORMING ORG. REPORT NUMBER
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9. PERFORMING ORGANIZATION NAME AND ADDRESS US Army Engineer District, St. Louis 210 Tucker Blvd. North St. Louis, MO 63101		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE July 1979 13. NUMBER OF PAGES 142
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16. DISTRIBUTION STATEMENT *(of this Report)*

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18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

The recommended plan consists of an approximate 8-foot landslide levee raise for the 14.8 miles of levee protecting 9,069 acres of agricultural land and the village of Fayol and Kaskaskia, Illinois on Kaskaskia Island.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

SUMMARY

FLOOD PROTECTION ON THE MISSISSIPPI RIVER BETWEEN SAINTE GENEVIEVE AND SAINT MARY'S MISSOURI

( ) Draft Environmental Statement (X) Final Environmental Statement

Responsible Office: U.S. Army Engineer District, 210 North 12th Street. St. Louis, Missouri 63101 Phone: 314/268-2822

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

2. Description of Action: The recommended plan consists of an approximate 8-foot landside levee raise for the 14.8 miles of levee protecting 9,069 acres of agricultural land and the village of Pujol and Kaskaskia, Illinois on Kaskaskia Island. Protection from flooding from the Mississippi River will be increased to 46.6 feet on the Chester, Illinois gage or a flood with the probability of occurrence of once in approximately 50 years. This is equivalent to that afforded other agricultural areas along this reach of the Mississippi River. The plan also includes enlargement of existing gravity drains to improve interior drainage. Eleven borrow pits (472 acres) will furnish aquatic habitat, of which 7 borrow pits (332 acres), unprotected by levees, will fill with silt in approximately 20 years and 4 borrow pits (140 acres), protected by levees, should last the 100 year life of the project.

3. a. Environmental Impacts: The project will increase flood protection for 8,162 acres of crop land from about 10 year to approximately 50 year frequency and increase interior drainage. This will increase crop productions and reduce rural property damages. Since the levee raise will be on the landside of the existing levee, in agricultural land and all borrow pits located in agricultural land, very little wildlife habitat will be affected. The possible loss of approximately 148 acres of marsh and 73 acres of oxbow ponds from the interior of Kaskaskia Island will be offset by creation of 472 acres of aquatic habitat from the borrow pits.

b. Adverse Environmental Effects: A total of 188 acres of cropland will be lost inside the levee, 140 acres will be permanently lost outside the levee, and 332 acres will be temporarily lost outside the levee. Three households and 3 farm sheds will have to be moved because of levee constructjion. There will be temporary adverse impacts on the island population from noise and dust associated with construction.

There will be a possible loss of approximately 148 acres of marsh and 73 acres of oxbow ponds from the interior of Kaskaskia Island due to improved drainage by enlarged gravity drains. Water quality and aquatic organisms will suffer temporary adverse impacts from increased suspended solids in runoff during construction and long-term impacts from increased sedimentation and turbidity and use of pesticides and fertilizers because of intensified agricultural activities.

Raising the levee has the potential for affecting 25 archaeological sites, but prior to any construction the sites will be tested. The levee raise will have secondary impacts on St. Mary's, Missouri and Ste. Genevieve, Missouri of raising flood heights for river stages between the top of the existing levee and top of the new levee. The increase in St. Mary's will be 0.6 feet resulting in $3,000.00 of annual damages and in Ste. Genevieve will be 0.6 feet resulting in $7,000.00 of annual damages.

4. Alternatives: Included among the alternatives considered for reduction of flood damages on the island were the structural measures of constructing a riverside levee raise and enlargement with different crown width, levee raise with and without increased gravity drain sizes, and the non-structural measures of purchasing all structures on the island with continued private ownership and framing of the land, purchasing the entire island for development and management as a wildlife area, and purchasing the island for a combination leaseback for agriculture and management of wildlife. During Phase I reevaluation, three alternative plans were developed in detail, a National Economic Development (NED) Plan, and Environmental Quality (EQ) Plan, and the Selected Plan.

5. Comments Requested:

Advisory Council on Historic Preservation
U.S. Department of Agriculture
Forest Service
Soil Conservation Service
U.S. Department of Commerce
U.S. Department of Health, Education and Welfare
U.S. Department of Housing and Urban Developement
U.S. Department of Interior
U.S. Department of Transportation
Regional Representative of the Secretary
U.S. Coast Guard
U.S. Environmental Protection Agency
U.S. Federal Engery Administration
U.S. Energy Research Development Agency
U.S. House of Representatives
U.S. Senate
Governor of Illinois
Governors Committee on Flood Control

Page 119 is not missing but is misnumbered.

5. Comments Requested (continued):

State Clearinghouse
Illinois Archaeological Survey
Illinois Natural History Survey
Illinois State Geological Survey
Illinois Environmental Protection Agency
Illinois Natural Resource Development Board
Board of Supervisors of:
    Randolph County, Illinois
    Ste. Genevieve County, Missouri
    Perry County, Missouri
Mayors of:
    Ste. Genevieve, Missouri
    St. Mary's, Missouri
Kaskaskia Island Drainage and Levee District Commissioners
East-West Gateway Coordinating Council
Southeastern Missouri Regional Planning Commission
Southwestern Illinois Metropolitan Area Planning Commission
American Fishery Society, Illinois Chapter
Audubon Society
    National Audubon Society
    Audubon Society of Illinois
Migratory Waterfowl Hunters, Inc.
Coalition for the Environment
Environmental Defense Funds, Inc.
Environmental Response
The Coalition on American Rivers
The Izaak Walton League, Inc.
Sierra Club
    Ozark Chapter
    Piasa Palisades
The Wildlife Society, Illinois Chapter
Friends of the Earth
Advisory Board on National Parks, Historic Sites, Buildings and Monuments.
The Nature Conservancy, Illinois Chapter
Ducks Unlimited

6. Draft statement to CEQ 10 April 1977.

DRAFT

ENVIRONMENTAL STATEMENT

FLOOD PROTECTION ON THE MISSISSIPPI RIVER
BETWEEN SAINTE GENEVIEVE AND SAINT MARY'S, MISSOURI

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1. PROJECT DESCRIPTION

1.1. INTRODUCTION

The project area is located in the existing Kaskaskia Island Drainage and Levee District in Randolph County, Illinois. This portion of Illinois has been cut off by a change in the channel of the Mississippi River and is now on the right bank, west of the river between river miles 111.0 and 116.0 above the mouth of the Ohio River. The area protected by the levee district consists of 9,069 acres of agricultural land and the incorporated villages of Kaskaskia and Pujol. There are approximately 70 to 75 dwellings on the island and the total population is 233. Historical features on the island include a Victorian era brick church and a small shrine housing a historic bell.

1.2. AUTHORIZATION AND HISTORY

The plan of improvement for Kaskaskia Island Drainage and Levee District was authorized by the U.S. Senate and House of Representatives on 23 October 1962 under the provisions of Section 203 of Public Law 87-874. The survey report was printed as House Document No. 519.

The authorized plan of improvement provided increased protection against flooding by raising (approximately 8 feet) and enlarging the existing 14.8 miles of levee surrounding the Kaskaskia Drainage and Levee District to the 1944 approved grade. This plan also included the extension of the seven existing gravity drains to accommodate the enlarged levee section and required seepage berms. The authorized level of protection (46.6 feet on the Chester,Illinois gage or a flood with the probability of occurence of once in approximately 50 years) is equivalent to that afforded other agricultural areas along this reach of the Mississippi River. Originally, additional flood protection was considered for the area between Ste. Genevieve and St. Mary's, Missouri, but lack of local support in the Ste. Genevieve District led to authorization of increased protection for Kaskaskia Island only.

The recommended plan is essentially an affirmation of the authorized plan inasmuch as the project levee grade, alignment of the levee and acres protected are almost identical. However, the recommended plan differs from the authorized plan in that it incorporates a landside enlargement instead of a riverside enlargement and reduces the crown width of the levee from 20 feet to 10 feet. Both of these modifications to the authorized plan were derived as a result of economic necessity. Together they reflect a cost saving critical to economic justification. The recommended plan also includes

replacement of gravity drains which increases costs; they will be replaced with larger gravity drains to satisfy a current need, i.e., a need not fully explored at the time of authorization. All larger gravity drains will be at the same elevation as the existing gravity drains, except the one at the northeast corner of the island (54" drain). It will be lowered 1.5 feet to bring it to ground level.

1.3 PROJECT FEATURES

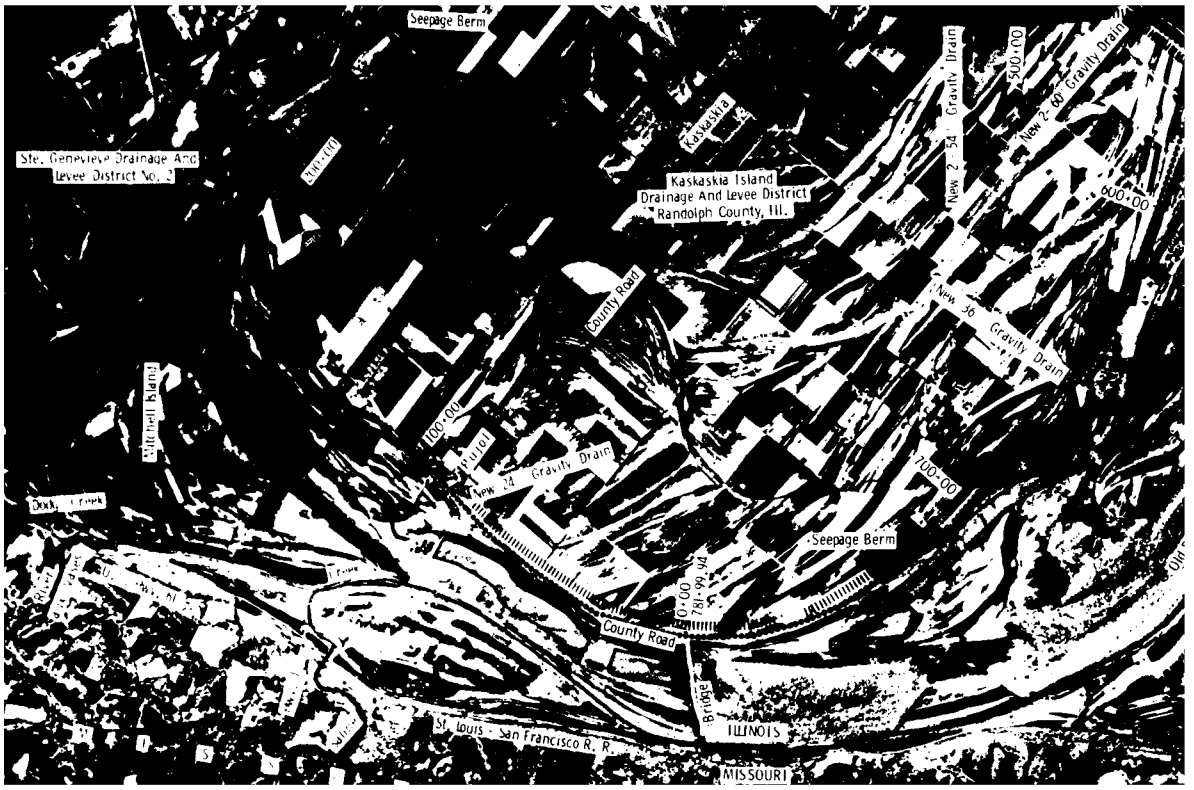
As noted previously, the project plan consists of a landside enlargement of the Kaskaskia Island Levee along the present alignment to provide the authorized level of protection. The width of the levee crown will be 10 feet with widened sections at 1/2 mile intervals to facilitate mobility during flood fight operations. The project plan also includes replacement of existing gravity drains as indicated below:

1. 30" drain replaced by 54" drain*
2. 18" drain replaced by 36" drain
3. 18" drain replaced by 36" drain
4. 24" drain replaced by 2-54" drains
5. 36" drain replaced by 2-60" drains
6. 36" drain replaced by 36" drain
7. 12" drain replaced by 24" drain

* Lowered 1.5 feet

The investigation of seepage berm requirements was accomplished in considerable detail so as to define the locations and physical dimensions of the berms. This information is shown on Plate 1-1. The landside enlargement with a crown width of 10 feet requires an approximately 50-foot strip right-of-way adjacent to the levee.

As environmental mitigation, archeological sites will be excavated and appropriately reported on. Also, marsh plantings consisting of Chufas, Arrowhead, Hardstem Bulrush, River Bulrush and Sago Pondweed will be planted with a 16-foot strip (44 acres) surrounding the borrow pits. The entire 472 acre of borrow pits will be seeded, the first year, with Japanese Millet to furnish food for water fowl. Acquisition of environmental assurance will be obtained in order to guarantee certain borrow pits will not be cultivated for the first 20 years of the project life. Borrow pits in the Ste. Genevieve Levee District No. 2 will not be cleared or cultivated for the life of the project.


Seepage Berm
Ste. Genevieve Drainage And Levee District No. 3
Kaskaskia
Kaskaskia Island Drainage And Levee District Randolph County, Ill.
New 2-54 Gravity Drain
New 2-60 Gravity Drain
500+00
600+00
County Road
New 2-36 Gravity Drain
Mitchell Island
100+00
Natural
New 2-44 Gravity Drain
700+00
Seepage Berm
781+99.34
10+00
County Road
Bridge
ILLINOIS
St. Louis - San Francisco R. R.
MISSOURI

1.4 BENEFIT - COST SUMMARY

The selected plan has a benefit to cost ratio of 1.09 to 1. Benefits creditable to the improvements consist primarily of damages eliminated to crops, damages prevented to property, increased crop returns, and reduction of annualized PL99 expense. Average annual benefits and costs are presented in Appendix A.

2. ENVIRONMENTAL SETTING WITHOUT THE PROJECT

2.1 PHYSICAL ELEMENTS

2.1.1. GEOLOGICAL ELEMENTS

Kaskaskia Island Drainage and Levee District is located in Randolph County, Illinois, on the west bank of the Mississippi River between river miles 110.0 and 116.0 above the mouth of the Ohio River. The study area lies entirely in the flood plain of the Mississippi River, which is about five miles wide in this reach of the river. The eastern and western bluffs rise some 200 to 350 feet above the alluvial valley. These bluffs are composed primarily of limestone of Mississippian geologic age with a thin covering of Pleistocene (Ice Age) loess.

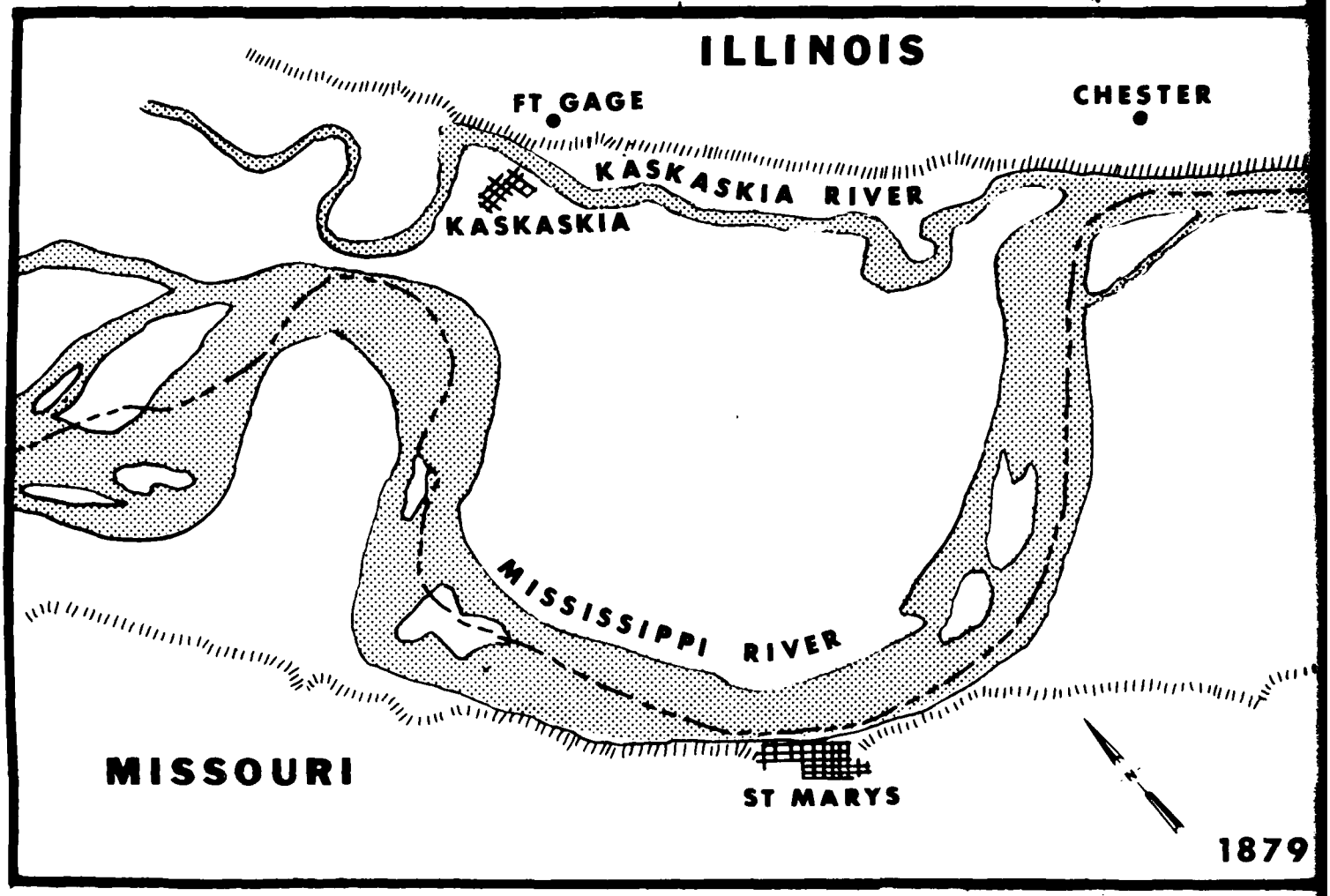
Locally, the Mississippi River is flowing on glacial drift which fills the bedrock valley of the river to a depth of 100 to 130 feet. A typical cross-section of the valley fills consists of a surface layer of sand, silts or silty clay which are recent river deposits; a thick layer of fine to medium sands of glacial age; a bottom layer of boulders, cobbles and gravels of glacial age; and Mississippian age bedrock.

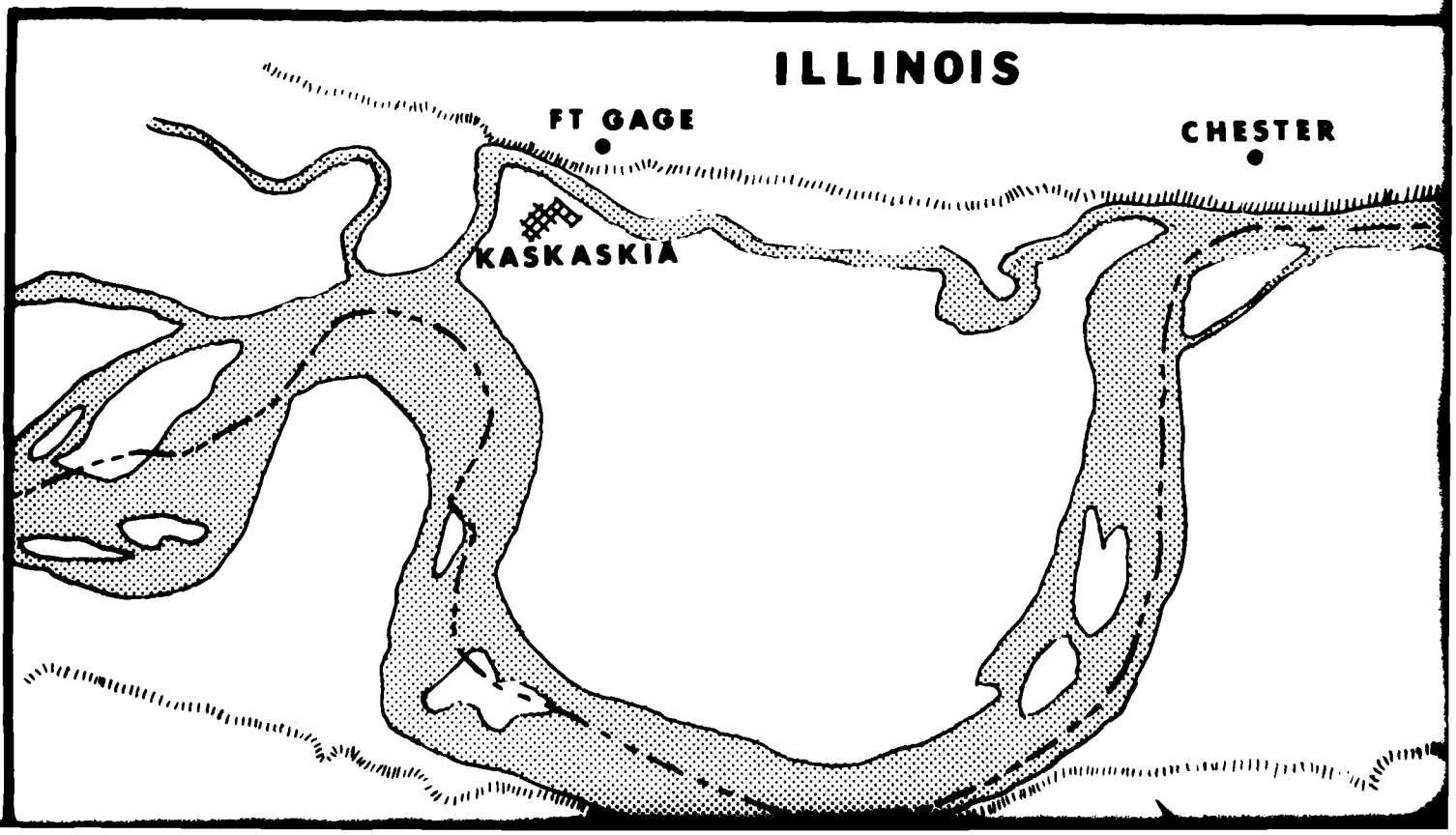
The topography of the Kaskaskia Island Drainage and Levee District consists of a series of low (5 to 15 feet relative relief) ridges and swales. The ridges, composed of silts and sands, are old natural levees, sand bars and islands, while the swales are old water courses (sloughs, chutes) which may be filled with water or are marshes or low areas filled with silts and silty clays (see Soils).

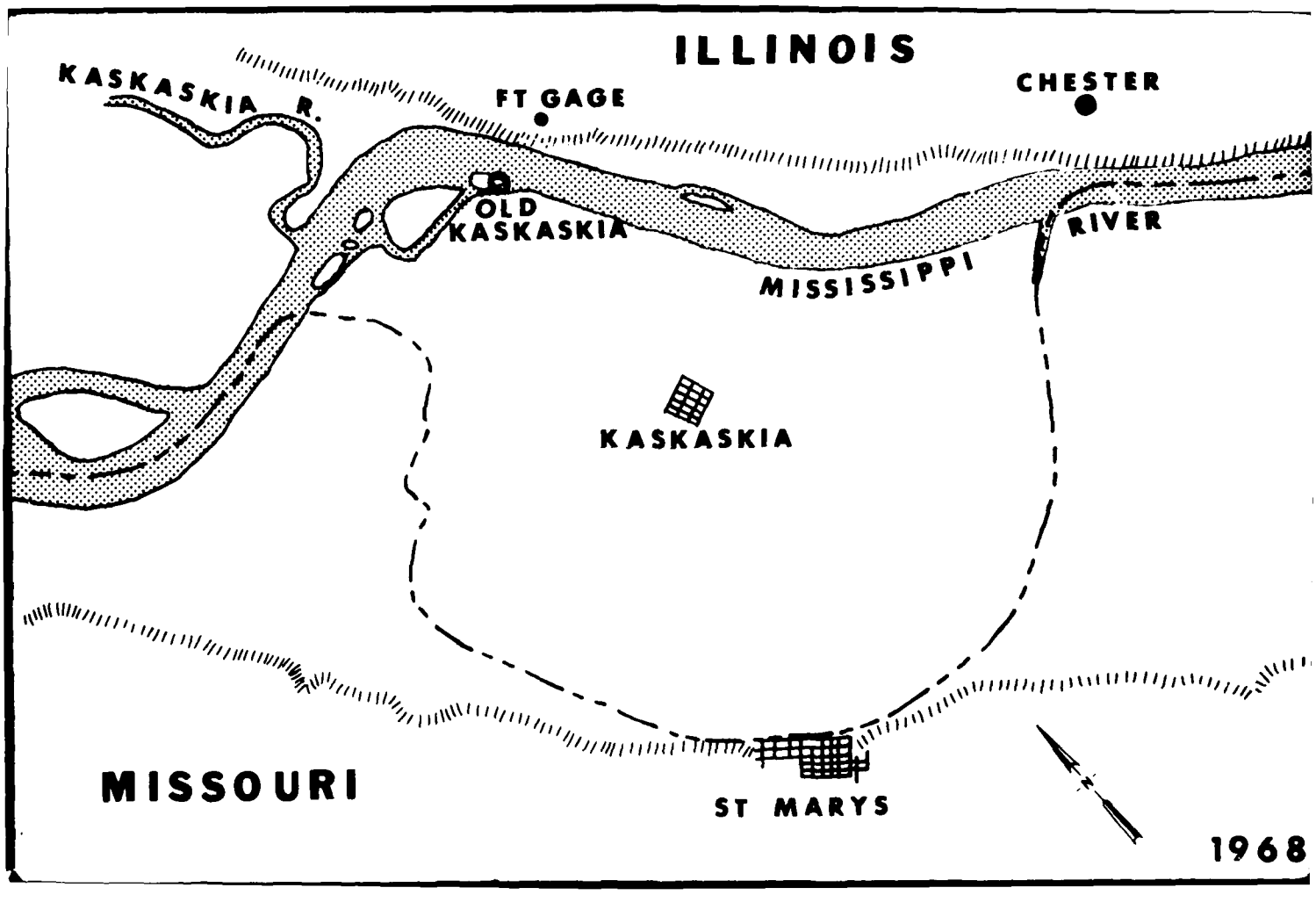
The most important physical feature of the study area is the old channel of the Mississippi River. Plate 2-1 illustrates the position of the Kaskaskia and Mississippi Rivers before and after the channel migration.

The Corps of Engineers began work in 1876 to protect the east bank of the Mississippi River with riprap (stones) and brush rafts

MIGRATION OF THE MISSISSIPPI RIVER CHANNEL






ILLINOIS
KASKASKIA R.
FT GAGE
CHESTER
OLD
KASKASKIA
MISSISSIPPI
RIVER
KASKASKIA
MISSOURI
ST MARYS
1968

to prevent migration of the river across the narrow neck of land separating the Mississippi from the Kaskaskia River. In 1879, a Corps engineer reported "The condition of the work at Kaskaskia bend cannot be called good". In April 1881, the river broke through and captured the lower Kaskaskia which is the modern channel. The old channel began to silt up and today is largely in agricultural fields.

2.1.2. GROUNDWATER

Groundwater levels in the project area are generally at or near the top of the pervious sands and gravels which underlie the modern fine-grained soils. The groundwater surface may be closely correlated with the levels of the river due to the close proximity of both the modern and old river channels which encircle the island.

2.1.3 SOILS

The soils of the study area were mapped by the University of Illinois, Agricultural Experiment Station in 1925 and more up-to-date information is not available. Plate 2-2 illustrates the geographical distribution of the soils mapped during this survey.

The old descriptive names may be converted to the approximate modern soil series and the series' taxonomic classification by use of Table 2-1.

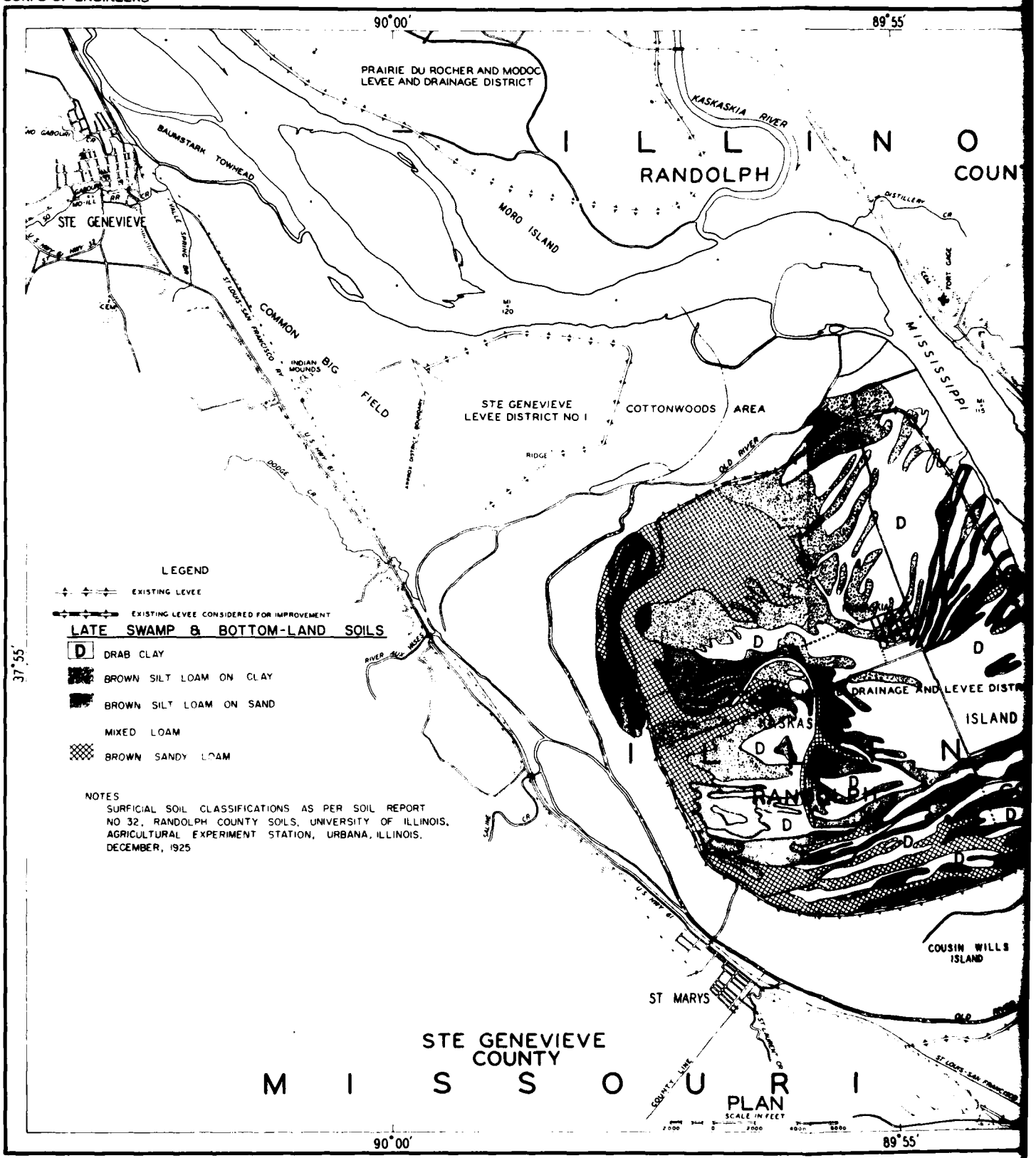
The Island has "ridge and swale" topography which is a reflection of the recent disposition and scour of the river. The soils with the lower permeability and surface runoff potential are located in the swales while the ridges are usually composed of coarser materials with greater permeability and faster surface runoff.

2.1.4. HYDROLOGIC ELEMENTS

Since there are no stream gaging stations within the drainage area of Kaskaskia Island, a runoff value cannot be accurately determined. Average annual runoff from stream basins in the St. Louis District usually amounts to 20-40 percent of the total rainfall. Interior runoff drains to the levee in the natural swales and is then discharged through the levee by seven gravity drains. Since there are no pumping facilities located on the island, substantial interior flooding can occur during periods of blocked drainage.

The nearest stream gaging station to Kaskaskia Island is at Chester, Illinois, located at river mile 109.5. The average discharge since 1927 is 183,600 cfs. Major floods of record for the Mississippi River at Chester are shown in Table 2-2.

CORPS OF ENGINEERS



U. S. ARMY

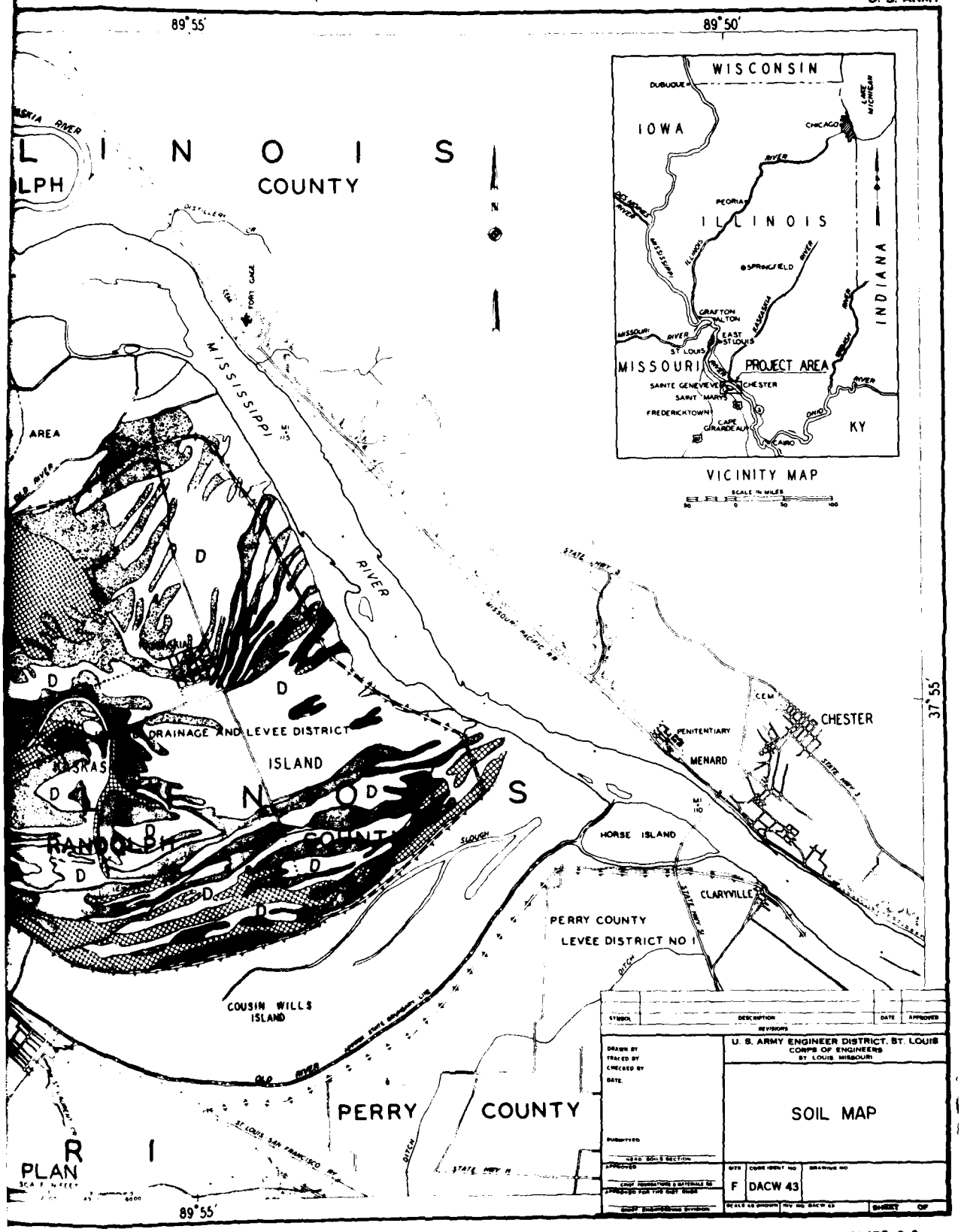


PLATE 2-2

TABLE 2-1

SOIL CLASSIFICATION CONVERSION CHART *

Old Descriptive Name	Modern Soil Series Name	Taxonomic Classification
Brown Silt Loam on Clay	Dupo Silt Loam**	Aquic Udifluents Course-silty over clayly, mixed, Nonacid, Mes
Drab Clay	Darwin Silty Clay	Vertic Haplaquolls Fine, Montmorillonitric, Mesic
Brown Silt Loam on Sand	Medway** Silt Loam	Fluvaquentic Haplaquolls Fine-Loamy, Mixed, Mesic
Brown Sandy Loam	Landes Sandy Loam	Fluventic Hapludolls Coarse, Loamy, Mixed, Mesic
Mixed Loam	Wave Loam, frequently flooded	Fluventic Hapludolls Coarse-Loamy, Mixed, Nonacid, Thermic

* Source: Soil Conservation Service

** Meets prime farmland criteria unless they flood more often than once every two years.

TABLE 2-2
MAJOR FLOODS OF RECORD
MISSISSIPPI RIVER AT CHESTER, ILLINOIS

Date of Peak	Peak Gage Reading (ft.)	Peak Discharge (cfs)
30 June 1844	39.8	1,350,000
June 1851	-	1,035,000
June 1855	-	1,065,000
June 1858	35.7	1,070,000
7 May 1881	-	935,000
27 June 1883	-	930,000
21 May 1892	31.20	940,000
13 June 1903	33.40	1,060,000
21 June 1908	30.75	895,000
17 July 1909	31.05	890,000
26 April 1927	34.41	1,060,000
29 April 1929	33.10	878,000
24 May 1943	38.08	873,000
2 May 1944	37.55	842,000
4 July 1947	38.17	886,000
22 July 1951	39.3	795,000
15 July 1969	35.73	644,000
30 April 1973	43.32	886,000

2.1.5. WATER QUALITY

Only limited water quality sampling has been performed in the Kaskaskia Island area. The Old River channel near St. Mary's, Missouri, and a ponding area adjacent to the Old River south of Kaskaskia Island, were sampled in November of 1975 and May of 1976. Kaskaskia Side Channel, a side channel of the Mississippi River at the northeast corner of the island, was sampled 23 June 1972 and 27 August 1972. Two Mississippi River main channel border areas, south of the island on the right bank, were also sampled. The one at river mile 105.4 was sampled on 15 July 1973 and the one at river mile 110.0 in September 1974. The parameters measured and the values obtained are shown in Tables 2-3 and 2-4. The values that exceeded the Illinois water quality criteria (State of Illinois Environmental Protection Agency 1976) were fecal coliforms in the Old River; copper and manganese, in both the Old River and the ponding areas; and total phosphate, iron, and mercury in the Old River, the ponding area; and the main channel border area at river mile 110.0. The major sources of water pollution in this area are agricultural runoff and sewage from St. Mary's, Missouri, entering the Old River. Also, the water quality, during periods of high flow when water is backed up into the Old River, will be affected by other effluents being discharged into the Mississippi River upstream of Kaskaskia Island.

2.1.6. AIR QUALITY

Air quality in the Kaskaskia Island area is quite good due to the rural character of the region and its considerable distance from a large metropolitan area. Most of the air pollutants consist of suspended particles from agricultural operations.

2.1.7. CLIMATE

The southern Missouri and southern Illinois region has a continental climate with hot summers and comparatively mild winters. The average precipitation at Chester, Illinois, is 39 inches evenly distributed during the year. The mean average temperature at Chester is about 57 degrees Fahrenheit, with a July mean temperature of 79 degrees and a January temperature that averages about 34 degrees Fahrenheit.

2.2 BIOLOGICAL ELEMENTS

2.2.1 AQUATIC COMMUNITIES

2.2.1.1 GENERAL

Aquatic habitat on and adjacent to Kaskaskia Island include the Mississippi River to the east; Kaskaskia side channel to the northeast

Table 2-3 Kaskaskia Island Water Quality Analysis

	Old River Near St. Marys Missouri		Old River South of Kaskaskia Island	Ponding Area South of Kaskaskia Island		Mississippi River Main Channel Border Area (River Mile 110)	State of Illinois Water Quality Criteria
Date	11/5/75	6/15/76	6/15/76	11/5/75	6/15/76	9/73	
Air Temperature (°C)		32	29		30		
Water Temperature (°C)	18	24	25	20	26		
Dissolved Oxygen (mg/l,	5.8	4.7	4.1	6.8	4.3		5.0
pH	7.8	7.5	7.3	7.3	7.8		6.5 - 9.0
Fecal Coliform (cts/100 ml)	450	420	205	90	40		
Fecal Streptococci (cts/100 ml)	680	390	188	360	600		200
Estimated Flow (cfs)		25-50	25-50		Ponded		
Bottom Type	Mud/silt	Gravel/silt	Mud/silt	Mud/silt	Mud/silt		
Appearance Oil & Grease	None	None	None	None	None		
Oil & Grease (mg/l)	1			1			
Total Alkalinity (mg/l $CaCO_3$)	235	272	284	228	332		
Chloride (mg/l)	18	21	19	4	7		500
Sulfate (mg/l)		2	1		3		
Sulfide (ppb)	50			50			
Specific Conductance (umhos/cm)	522	641	664	484	733		
Total Hardness (mg/l $CaCO_3$)		279	293		348		
Turbidity (JTU)	12	25	15	28	66		
Suspended Solids (mg/l)		43	22		134		
Volatile Solids (mg/l)	13	11	9	6	29		
Total Dissolved Solids (mg/l)	23	340	347	58	409		
Total Solids (mg/l)	331	386	374	354	535		
Biological Oxygen Demand (mg/l)	1	1.5	2.4		7.9		
Chemical Oxygen Demand (mg/l)	5	7	8	27	37	7.4	
Total Organic Carbon (mg/l)		26.7	17.8		41.3		
Nitrate Nitrogen (mg/l)	0.11	0.31	0.17	0.02	0.02	1.6	
Nitrite Nitrogen (mg/l)	0.10	0.02	0.02	0.01	0.01	0.031	
Ammonia Nitrogen (mg/l)	0.12	0.29	0.31	0.04	0.10	0.1	1.5
Total Kjeldahl Nitrogen (mg/l)	23.9	7.6	5.9	10.2	6.5	1.1	
Ortho Phosphate (mg/l)	0.03	0.03	0.04	0.02	0.11		

Table 2-3 Kaskaskia Island Water Quality Analysis (Continued)

	Old River Near St. Marys Missouri		Old River South of Kaskaskia Island	Ponding Area South of Kaskaskia Island		Mississippi River Main Channel Border Area (River Mile 110)	State of Illinois Water Quality Criteria
Date	11/5/75	6/15/76	6/15/76	11/5/75	6/15/76	9/73	
Total Phosphate (mg/l)	0.05	0.12	0.07	0.25	0.37	0.1	0.05
Phenol (ppb)		10	14		8		
Arsenic (ppb)	10	5.36	5.36	10	8.25	20	1,000
Heptachler Expoxide (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
Aldrin (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
Dieldrin (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
DDE (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
DDT (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
Lindane (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
Chlordane (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
Endrin (mg/l)	<0.02	<0.02	<0.02	<0.02	<0.02		
PCB (mg/l)		<0.05	<0.05		<0.05		
Total Iron (mg/l)	7.2			13.5		6.2	1.0
Ferrous Iron (mg/l)						1.0	
Lead (mg/l)	0.08			0.04		0.01	0..
Zinc (mg/l)	0.08			0.07		0.008	1.0
Copper (mg/l)	0.06			0.06			0.02
Manganese (mg/l)	1.26			3.74		0.03	1.0
Mercury (mg/l)	0.31			0.17		12.9	0.5
Cadmium (mg/l)						0.001	0.05

Table 2-4 SUMMARY OF PHYSIOCHEMICAL VARIABLES FOR KASKASKIA SIDE CHANNEL (MISSISSIPPI RIVER MILE 118.0-115.0) AND A MAIN CHANNEL BORDER AREA ON THE RIGHT BANK OF THE MISSISSIPPI RIVER (RIVER MILE 105.4-105.5)

Kaskaskia Side Channel

	23 June 1973			27 August 1972		
	Min.	Max.	$\bar{x}$	Min.	Max.	$\bar{x}$
Surface						
Temperature (°C)	25	27	26.3	26	27	26.3
Dissolved Oxygen(mg/l)	5.7	6.6	6.1	6.0	10.1	8.6
Turbidity (JTU)	95	475	230	65	120	88.3
Alkalinity (mg/l)	148	156	151.7	152	234	197.7
pH	7.6	7.8	7.7	7.6	8.0	7.8
Bottom						
Temperature (°C)	23	24	23.7	26	27	26.3
Dissolved Oxygen(mg/l)	2.7	5.9	3.9	5.7	9.2	7.0
Turbidity (JTU)	120	550	290	90	175	125.3
Alkalinity(mg/l)	149	162	155.3	153	233	197
pH	7.5	7.8	7.6	7.7	8.0	7.8

Main Channel Border Area
15 July 1973

	Surface			Bottom		
	Min.	Max.	$\bar{x}$	Min.	Max.	$\bar{x}$
Temperature (°C)	30	30	30.0	29	30	29.7
Turbidity (JTU)	200	245	221.7	440	500	480.0
Alkalinity (mg/l)	180	183	181.3	181	186	183.3
pH	7.8	7.9	7.9	7.8	7.9	7.8

(a side channel of the Mississippi River); Old River (Dodge Creek, River Aux Vases Creek, Saline Creek, and St. Laurent Creek); oxbow ponds (about 73 acres protected by the levee, 218 acres unprotected on the Illinois side of the Old River, and about 50 acres unprotected on the Missouri side); and marshes and wetlands (about 148 acres protected by the levee, 52 acres unprotected on the Illinois side of the Old River, and 52 acres unprotected on the Missouri side). The portion of the Mississippi River adjacent to the project area provides a diversity of aquatic habitat, including main channels, main channel border, side channels (chutes), and sloughs.

Data used in describing all aquatic habitats were obtained from Emge, et. al. (1974), Midwest Aquatic Enterprises (1975), and the Illinois Department of Conservation (unpublished). Emge's study was conducted on Kaskaskia side channel (river mile 118.0 to 115.8) and a main channel border area 5.5 miles down river from the study area (river mile 105.4 to 105.5) during three periods (sampling period I, 10 June - 1 July 1971; sampling period II, 21 August - 11 September 1972; and sampling period III, 10-28 July 1973). Midwest Aquatic Enterprises' study was performed under a limited time frame during May and early June of 1975 on the Mississippi River, Old River, Dodge Creek, River Aux Vases Creek, Saline Creek, St. Laurent Creek, a flooded field, and an oxbow marsh on Kaskaskia Island. The work by the Illinois Department of Conservation consisted of electrofishing in the Old River and some sloughs along the Old River during the summer of 1975.

2.2.1.2 PHYTOPLANKTON

Midwest Aquatic Enterprises (1975) identified 115 species and 54 genera from the 10 aquatic sampling stations in the Kaskaskia Island project area (Plate 2-3). Diatoms and green algae were commonly observed forms at most stations. The species present at most stations were indicative of eutrophic conditions. The relative importance of each group of algae changes markedly throughout the year; for instance, blue-green algae will probably become more abundant later in the summer because they can compete more successfully under the extreme conditions of heat and intense light.

The investigation by Emge et. al. (1974) indicated that the Kaskaskia Side Channel was characterized by a dominant diatom population and a high species diversity during sampling period I. Total phytoplankton increased greatly in sampling period II due to a large pulse of green algae. In the main channel border area, on the Mississippi River 5.5 miles south of the project area sampled during period III, total phytoplankton were very low. Diatoms accounted, on the average, for over 60 percent of the total phytoplankton collected.

KASKASKIA ISLAND, ILLINOIS

MISSISSIPPI RIVER MILES 110.0 TO 121.0

FIG. 2

AQUATIC COLLECTING SITES

MIDWEST AQUATIC ENTERPRISES

Mahomet, Illinois

June 1975

SCALE

0 1 2 miles

0 1 2 kilometers

PLATE 2-3

2.2.1.3 ZOOPLANKTON

Midwest Aquatic Enterprises (1975) discovered 12 species of cladocerans, seven species of copepods, and 23 species of rotifiers from zooplankton collections from the 10 aquatic sampling stations in the Kaskaskia Island project area (Plate 2-3). At virtually all stations, rofiters were the predominant zooplankters. The highest densities were found in the flooded field and oxbow marsh (Stations 9 and 10), demonstrating the apparent effects of quiet water on zooplankton.

Emge et. al. (1974) found in Kaskaskia side channel that Copepods were dominant during period I and were replaced by adult rotifers as the most abundant group during period II. Ranges and means of total zooplankton collected were similar in sampling periods I and II. In the main channel border area, the zooplankton were composed almost entirely of protozoans. Adult rotifers contributed less than 2 percent of the total. This area had an extremely low species diversity of 0.10 .

2.2.1.4 BENTHOS

Ninety-nine species of benthic macroinvertebrates were identified by Midwest Aquatic Enterprises (1975) from benthic collections from the ten aquatic sampling stations in the Kaskaskia Island project area (Plate 2-3). Although aquatic insects yielded the greatest number of species, the oligochaete worm fauna was especially diverse.

Benthos in Stations 1, 2, 5, 6, 7, 8 and 9 was dominated by oligochaetes and midges. Population densities were low for most individuals except for the burrowing mayfly, Hexagenia limbata. The Mississippi River (Stations 3 and 4) benthic fauna was dominated by oligochaete worms of several species. Aquatic Diptera comprised the remainder of the fauna. It is significant to note the absence of the burrowing mayfly, Hexagenia limbata from this area of the river. Two caddisflies, Hydropsyche orris and Potamyia flaua, were abundant along most of the Mississippi River as emerging adults. The oxbow marsh (Station 10) has a diverse fauna of aquatic true bugs (Hemiptera).

In the study by Emge et. al. (1974), oligochaetes and aquatic insects were the only benthic organisms observed in Kaskaskia side channel. Oligochaetes were numerically dominant and accounted for 56.6 percent of the total. Benthic organisms were collected from the main channel border area only during period III. Three classes, Insecta, Oligochaeta, and Pelecypoda, were represented in the samples. Classes Insecta and Oligochaeta accounted for about 99 percent of the total collection; of this total, Oligochaetes were about four times more abundant than insects.

2.2.1.5 FISH

Midwest Aquatic Enterprises (1975) lists 99 species of fishes known or likely to occur in the Kaskaskia Island project area. Few fishes were taken from the stations in the Old River (Station 1 and 2) during the May and June, 1975, collecting periods due to high water. Virtually all of these were gizzard shad.

Subsequent electrofishing in the Old River by the Illinois Department of Conservation provided more thorough sampling. Their collection yielded more than 106 kg of fishes, with more than 80% of this biomass consisting of gizzard shad, carp, buffalo (smallmouth, bigmouth, and black), and gar. Most of the remaining biomass consisted of a variety of sunfishes including warmouth, bluegill, largemouth bass, white crappie, and black crappie, and a few large bowfin. Among the centrarchids, bluegills and black crappies predominated.

In the Mississippi River (Stations 3 and 4) gizzard shad were again found to be the dominate fish species. The river fish population, based upon previous studies, is principally composed of cyprinid fishes, notably the emerald shiner and the river shiner. Next in abundance is the gizzard shad. Also among the more abundant fishes are carp and bigmouth buffalo. Dodge Creek and St. Laurent Creek (Stations 5 and 8) showed the typical small stream fish population predominated by minnows and sunfishes. Saline Creek (Station 7) was not sampled because of its similarity to River Aux Vases Creek (Station 6) which yeilded fish only shortly after collection had begun and then no more fish were taken during the bulk of the sampling period. Predominant among the fishes taken in the flooded field and oxbow marsh (Stations 9 and 10) were gizzard shad, mosquitofish, carp and shortnose gar. The population found is characteristic of oxbow lakes throughout the Midwest. The only species which was not taken and which often occurs in this habitat was the bigmouth buffalo. It should be noted that the fish had probably been isolated in that pond for almost a full year. Significant by their absence were young gizzard shad.

In Emge et. al. (1974) study of Kaskaskia side channel, approximately equal numbers of fish were captured during sampling periods II and III. During period II, 58 percent and 42 percent of the catch were in the young-of-year and adult/juvenile age classes, respectively. However, all of the fish collected during period III were categorized as young-of-year. Forage fish dominated during both periods. Sport fish were next in abundance in period II and commercial fish in period III. No predator fish were collected during either period. Species diversity indices were comparable during both periods.

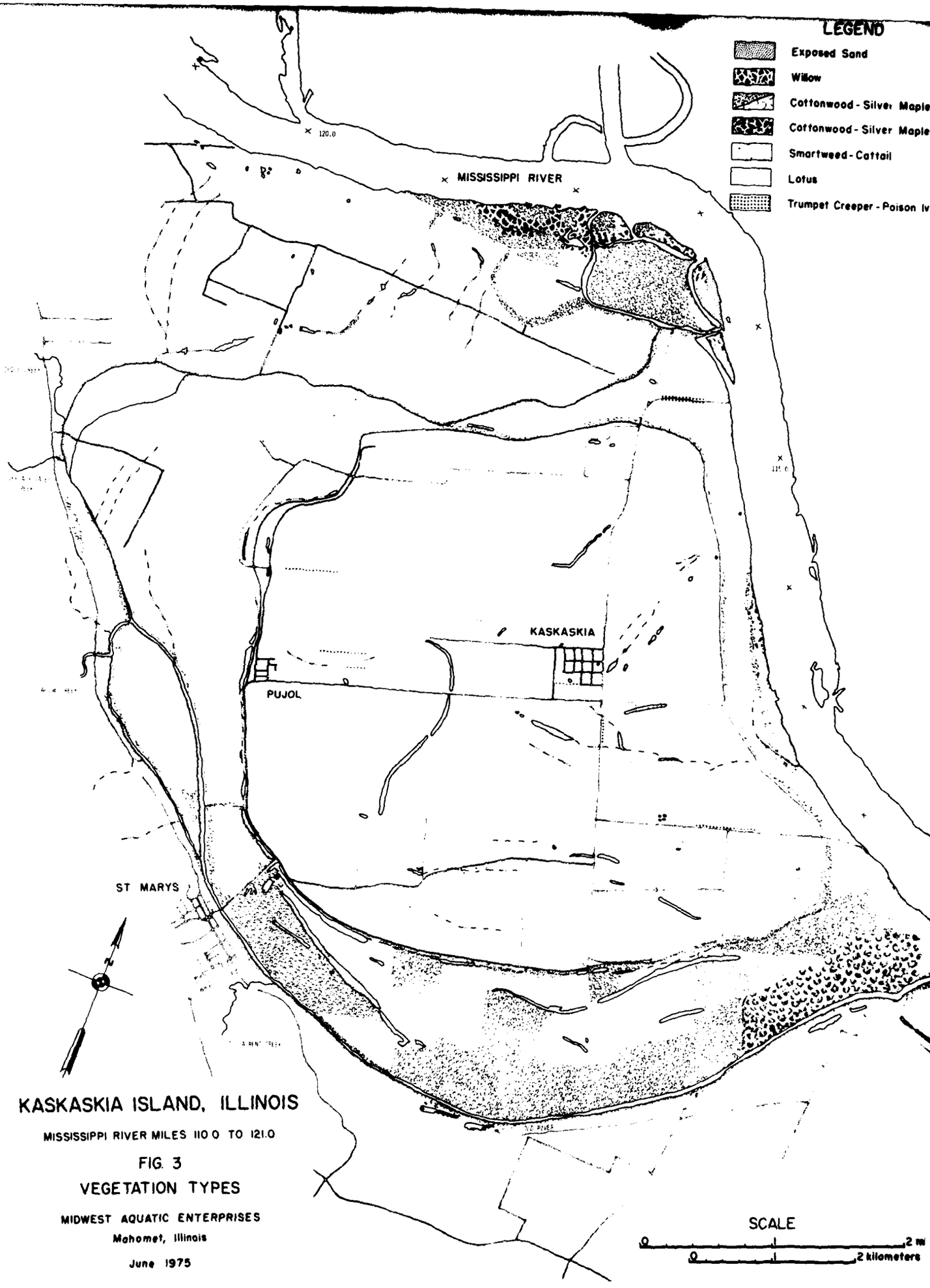
The entire catch, from the main channel border area studied by Emge, et. al. (1974) during sampling period II consisted of 12 individuals, all classified as forage fish and belonging to the adult/juvenile age group. Considerably more fish were captured during period III. About 80 percent of the catch were forage fish and about 20 percent belonged to the sport category. A major difference observed between sampling periods was the almost complete reversal of age classes represented in the catch. All fish captured during period II were classified as adult/juveniles; during period III, essentially only young-of-year were captured.

2.2.2 TERRESTRIAL COMMUNITIES

2.2.2.1 VEGETATION

Introduction. An area of approximately 22,926 acres was examined for biological elements and mapped. This included 15,747 acres which constitute the boundary of Kaskaskia Island in Randolph County, Illinois, and an additional 7,179 acres of adjacent countryside in Perry and Ste. Genevieve Counties, Missouri (Plate 2-4). The major vegetation types present in the study area are shown in Table 2-5.

The vegetation of this area is representative of the floodplain vegetation found throughout this portion of the Mississippi River Valley and described in studies by Terpening (1974) and Midwest Aquatic Enterprises (1975).



KASKASKIA ISLAND, ILLINOIS

MISSISSIPPI RIVER MILES 110.0 TO 121.0

FIG. 3

VEGETATION TYPES

MIDWEST AQUATIC ENTERPRISES

Mahomet, Illinois

June 1975

Table 2-5

Vegetation Types in Kaskaskia Island Area

Habitat	Acres	%
Exposed sand and revetments	27	0.17
Willow	244	1.58
Cottonwood-silver maple	2323	15.00
Cottonwood-silver maple-willow	355	2.29
Smartweed-cattail	115	0.74
Lotus	80	0.52
Trumpet creeper-poison ivy	37	0.24
Agriculture	12309	79.46
Total	15,490	

2.2.2.2 WILDLIFE

Wildlife Habitats. A listing of wildlife habitat types in the Kaskaskia Island are listed in Table 2-6.

Table 2-6

Wildlife Habitata in Kaskaskia Island Area

Habitat	Area	%
Urban	80.8 A.	0.5
Agricultural	12308.6 A.	77.8
Floodplain forest	2905.0 A.	18.4
Oxbow ponds	290.0 A.	1.8
Sandbar/mudflat	26.6 A.	0.2
Marsh	200.4 A.	1.3
Fencerows	14060.0 ft.	
Roadside ditches and levees	64.0 mi.	

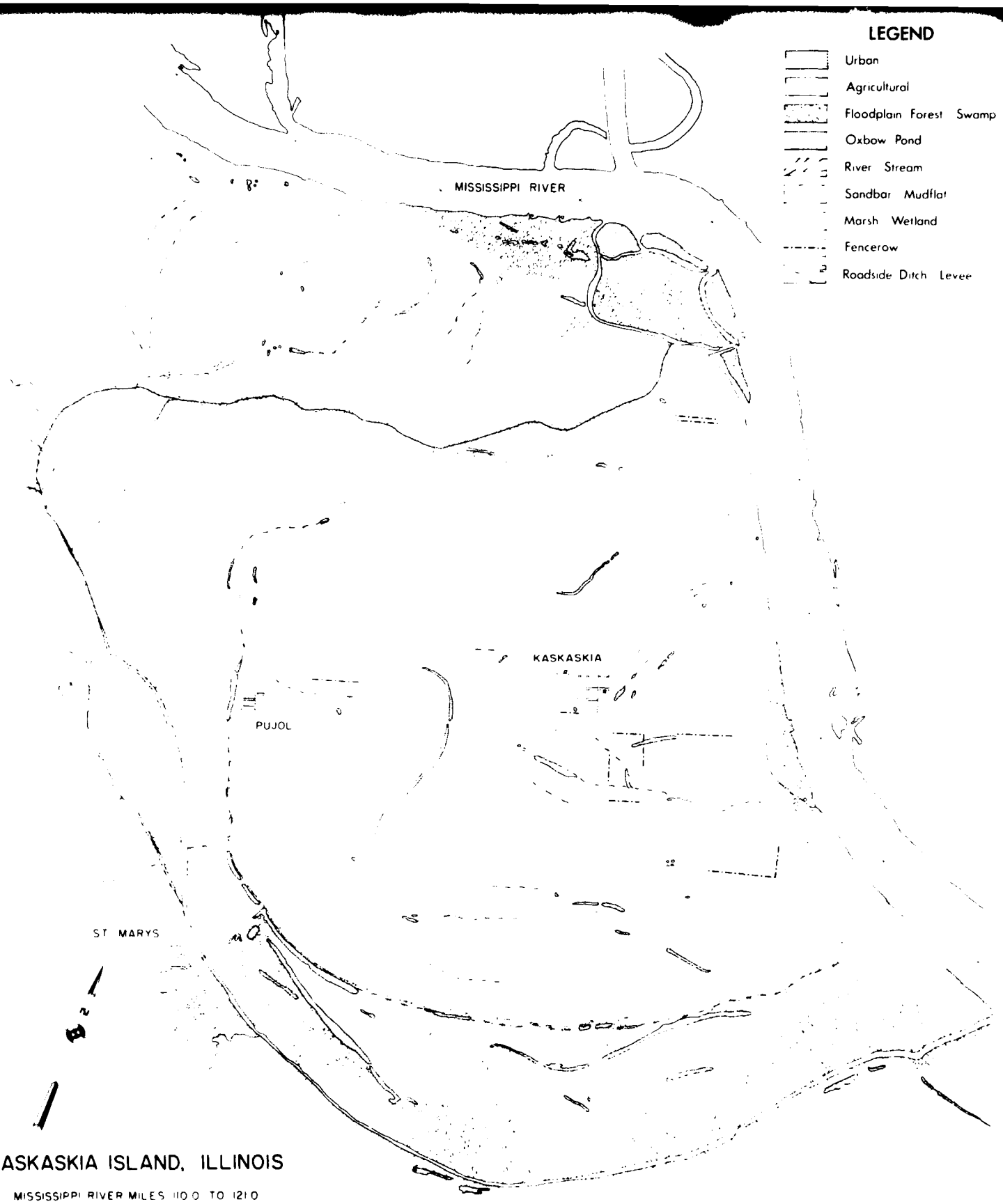
These wildlife habitat types have been plotted on the base map of the Kaskaskia Island project area and are shown in Plate 2-5.

Urban habitat in the project area consists of two small towns, Kaskaskia and Pujol, Illinois, and the somewhat larger town of St. Mary's Missouri. The rural atmosphere of the area and the vegetation of these towns is essentially an open forest edge environment. Among the wildlife, birds are especially diverse as both forest and prairie species find this habitat suitable. Most other wildlife characteristic of the forest edge are absent, probably because they are more wary and less tolerant of man's activities than are birds.

Agricultural land predominated on Kaskaskia Island. The principal crop at the time of field reconnaissance was winter wheat. Of less importance were corn and soybeans. It is anticipated that a late planting of soybeans would follow the wheat harvest.

Two vegetation types are grouped under the wildlife habitat type of floodplain forest including wooded seasonally flooded basins (Biotic Consultants, Inc. 1976). These include the willow, cottonwood-silver maple, and cottonwood-silver maple-willow vegetation types. Some of this habitat is present in fairly extensive tracts north of Kaskaskia Island, and especially, south of Kaskaskia Island between the levee and Old River channel. This habitat is subject to frequent (at least annual) and prolonged flooding and much of the terrestrial community is affected by these conditions. Most of the floodplain forest was inundated during field portions of this study.

The dual nature of this community is best reflected by its designation as "floodplain forest'swamp" in Plate 2-5. As river level



KASKASKIA ISLAND, ILLINOIS

MISSISSIPPI RIVER MILES 110.0 TO 121.0

HABITAT TYPES

MIDWEST AQUATIC ENTERPRISES

Mahomet, Illinois

June 1975

SCALE

0 1 2 miles

0 1 2 kilometers

causes the water to advance up slight elevational gradients or to retreat into depressions and as spring floodwaters convert the entire floodplain forest into a seasonally flooded basin, species adapted to one habitat or the other accordingly wax or wane. This is a case of two habitats separated by water regime rather than spatially.

Lakes and ponds in the project area were combined under the category of oxbow ponds. Some differences among ponds were noted, resulting from their location relative to the levees. These differences were not sufficient to merit distinction on the habitat map (Plate 2-5). Within the levee on Kaskaskia Island, these oxbows were almost exclusively characterized by the smartweed-cattail or lotus vegetation types. With the exception of floods which breach the levees, water level is maintained in these oxbows by runoff of rainwater and by percolation of river water through the soil. The strictly aquatic fauna of these ponds is landlocked between maximum flood periods. Oxbow ponds of the unprotected floodplain generally had wooded margins and, during high water periods, resembled wooded swamps, characterized by the cottonwood-silver maple or cottonwood-silver maple willow vegetation types. These oxbow ponds appear to flood frequently (at least annually) and their strictly aquatic fauna resembled that of the river more closely than did the fauna of the protected oxbows.

Rivers and streams in the project area include the Mississippi River, its former channel now called Old River, and the lower portions of Dodge Creek, River Aux Vases Creek, Saline Creek, and St. Laurent Creek. All of this habitat is subject to inundation by floodwaters from the Mississippi River and the four tributary streams could best be described as backwaters during most of the field portions of this study. As such, must of the aquatic community was similar to Old River. There were several notable differences among the faunas, however, which probably represented survivors from preinundation conditions, or recent immigrants from upstream areas.

Sandbars and mudflats, at the time of this study, were confined to islands at the north end of Kaskaskia Island. Presumably, this habitat becomes more extensive later in the year as the water level in the Mississippi River drops. This habitat is transitional between the aquatic and terrestrial ecosystems and is shared by inhabitants of both.

Marshes and wetlands occur principally within the levees on Kaskaskia Island and on the north end of Old River. Marshes represent a stage in

the aging process of lakes in temperate regions. Several stages in this aging sequence are visible in the project area. Young oxbows are the most river-like. Banks are often wooded and drop off steeply. These oxbows flow during high water periods. Older oxbows are not as deep and have gently sloping banks and shallows along their margins. These shallows are characterized by the smartweed-cattail vegetation type. Still older oxbows are shallower and emergent vegetation frequently extends to their centers. These marshes are characterized by the lotus vegetation type and, often have smartweed-cattail vegetation along their margins. Still older oxbows have filled in to the extent that the smartweed-cattail vegetation type extends from bank to bank. Ultimately, the filling process continues to dry land, and, on Kaskaskia Island, this land is cultivated.

Fencerow habitat was restricted to a few field margins, mostly near Kaskaskia and Pujol. This habitat was characterized by the trumpet creeper-poison ivy vegetation type, with intrusions of small cottonwoods and silver maples. An exception is the roadside fencerow on the northeast corner of the island. This consisted of mulberry.

Maintained roadside ditches and levees were characterized by graminoids, bachelor's button, clover, and various other herbaceous plants. This habitat was quite extensive on the island, due mostly to the levees, and probably was the principal habitat utilized by prairie-dwelling animals.

Waterfowl. Of prime importance among birds in the type of habitat found along the Mississippi River are the herons and egrets and the migratory waterfowl. These groups have been the subjects of annual censuses since 1972. Results of these censuses are discussed below.

As part of the Mississippi River waterfowl census for the U.S. Army Corps of Engineers, St.Louis District, forested areas in the river bottoms were surveyed from the air during 1973 and 1974 for colonies of breeding wading birds.

Although the Middle Mississippi River provides a large amount of suitable (in appearance) habitat for nesting herons, only three colonies were observed during 1973. By 1976 a nesting colony of nine great blue herons was discovered on the southern portion of Kaskaskia Island.

These colonies contained nests of great blue herons, cattle egrets, black-crowned night herons, and common egrets. The sizes of the colonies seems to vary yearly from a few hundred nests to thousands in the past.

Breeding heron populations along the Mississippi River adjacent to southern Illinois (including Kaskaskia Island) are surprisingly low,

considering the large amount of likely habitat. Similar areas along the Mississippi River north of St. Louis, Missouri, yield more closely spaced colonies, by roughly two or three times.

Prior to 1972, only limited aerial surveys had been made of the waterfowl resources of the Mississippi River adjacent to southern Illinois. At the request of the U.S. Army Corps of Engineers, Wildlife Specialists Drs. Frank C. Bellrose and Glen C. Sanderson and Mr. Robert Crompton, all of the Illinois Natural History Survey, undertook a series of aerial censuses to determine the use of this area by waterfowl.

The entire area censuses extended from the confluence of the Mississippi and Ohio Rivers upstream along the Mississippi to St. Louis, Missouri. One of the subdivisions of the census extended from Chester, Illinois, to Ste. Genevieve, Missouri. The top five waterfowl species in the Kaskaskia Island area were mallard, lesser scaup, ring-necked duck, black duck, and wigeon.

Results of these inventory flights showed that waterfowl in the portion of the Mississippi River studied were associated primarily with sand bars and the sloughs usually present between the sand bar and the river bank. Utilization was primarily for resting during migration.

Of more than 17.5 million ducks migrating annually down flight corridors in the United States east of the Rocky Mountains, Bellrose (1968), estimated that the largest portion, more than 12 million, entered the geographical confines of the Mississippi Flyway including Kaskaskia Island. The main breeding species is the wood duck which utilizes the bottomland forest/swamp habitat.

Hunting and Trapping. Aside from waterfowl, the following are the principal game species available for hunting on Kaskaskia Island: white tailed deer, gray and fox squirrels, cottontail rabbits, bobwhites, and mourning doves.

Trapping in the project area is rather limited with muskrats being the most common furbearer.

2.2.3 RARE AND ENDANGERED SPECIES

The Endangered Species Act of 1973 (P.L. 93-205) directs federal agencies "...to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of these species or result in the destruction or modification of these species' habitat that is determined to be critical by the Secretary (of Interior) after consultation with the affected States". Only those species that are classified as endangered or threatened and published in the Federal Register by the Office of Endangered Species are protected by this Act.

The following species that are on the federal list may periodically occur in the project area:

a. American Peregraine falcon (Falco peregrinus tundrius) Status- Endangered. This bird breeds in the artic tundra and may pass through the study during migration. Its decline is mainly attributed to insecticides adversly affecting its reproductive success. (USDI, 1973)

b. Southern Bald Eagle (Haliaeetus l. leucocephalus) Status- Endangered. This species is extremely rare in the study area. The nearest breeding population is in the lower Mississippi Valley north to Arkansas and Tennessee. An occasional bird could wander northward after the nesting season. The main reason for the species decline is reduced reproduction caused by insecticides, and encroachment on nesting sites. (USDI, 1973). In the study area the Bald Eagle would utilize the bottomland forests for roosting and could feed on migratory or resident waterfowl that utilize the wetlands and agricultural lands in the study area.

c. Gray Bat (Myotis grisescens) Status - Endangered. The gray bat lives in caves all year. They generally hibernate in different caves than where they spend the summer. They may utilize the bottomlands for feeding on insects in the summer. The main cause for this species decline is human disturbance of hibernating and maternity colonies by entering caves.

d. Indiana Bat (Myotis sodalis) Status - Endangered. This species hibernates in caves or mines in the winter and has been seen using both riparian trees (Humphrey, 1974) as well as flood plain, hillside and ridge forests (University of Missouri, 1977). In the study area, this bat could use the stream or ditch side trees for feeding. The primary cause of decline for this species is believed to be disturbance of hibernating bats by people entering caves in the winter.

Table 2-7 summarizes the rare and endangered plants and animals of the Kaskaskia Island project area including Randolph County, Illinois, and St. Genevieve and Perry Counties, Missouri. This list was compiled from six sources: Holt, et.al. (1974), Lopinot and Smith (1973), U. S. Department of the Interior, Fish and Wildlife Service (1974), Illinois

Nature Preserves Commission and Illinois Department of Conservation (1976), U.S. Army Engineer District, St. Louis, Missouri (1976), and U.S. Department of Interior (1976 a. and b.).

Table 2-7 , Rare and Endangered Plants and Animals of the Kaskaskia Island Project, area, Including Randolph County, Illinois, and Ste. Genevieve and Perry Counties, Missouri.

PLANT KINGDOM			
SPECIES	MO	IL	U.S. DEPT. INTERIOR
LIVERWORTS			
Microlepidozia sylvatica (Evans) Joerg.	E		
Bassania trilobata (L.) S. F. Gray	E		
Marsupella sullivantii (DeNot) Evans	E		
MOSSES			
Bryoxiphium norvegicum (Brid.) Mitt. Sword moss	E		
Rhabdoweisia denticulata (Brid.) B.S.G.	E		
Syrrhopodon texanus Sull.	E		
Philonotis capillaris Lindb.	E		
Isopterygium dischaceum (Mitt.) Jaeg. & Sauerb.	E		
Isopterygium muellerianum (Schimp.) Jaeg. & Sauerb.	E		
Thamnobryum alleghaniense (C. Mull.) Nieuwl.	E		
Sphagnum capillaceum (Weiss.) Schrank var. tenerum (Sull. & Lesg. ex Sull.) Crum	E		
CLUBMOSSES			
Lycopodium lucidulum Michx Shining Clubmoss	R		
Lycopodium obscurum L. Round-branched Ground Pine	E		

Table 2-7 Continued.

PLANT KINGDOM			
SPECIES	MO	IL	U.S. DEPT. INTERIOR
Lycopodium porophilum Lloyd & Underw. Fir Clubmoss	R		
Lycopodium tristachyum Pursh Ground Cedar	SU		
FERNS			
Dennstaedtia punctilobula (Michx.) Moore Hay-scented fern	R		
PONDWEED			
Potamogeton pusillus L. Pondweed	R		
SEDGES			
Scleria nitida Willd. Shining nut-rush	R		
Carex tonsa Bickn. Shaved sedge	E		
ORCHIDS			
Isotria verticillata (Willd.) Raf. Large whorled pogonia	R		
Malaxis unifolia Michx. Adder's Mouth Orchid	R		
Goodyera pubescens (Willd.) R. Br. Rattlesnake plantain	R		
Draba aprica Beadle Whitlow Grass	E		
ELMS			
Ulmus spp. Elms	E		
VIOLETS			
[illegible]			

Table 2-7 Continued.

SPECIES	MO	IL	U.S. DEPT. INTERIOR
PLANT KINGDOM			
HOLLY			
Ilex opaca Ait.			
Ammerican Holly	E		
EVENING PRIMROSES			
Jussiaea leptocarpa Nutt.			
Primrose willow	SU		
HEATHS			
Rhododendron roseum (Loisel.) Rehd.			
f. *albidum* Steyermark.			
Azalea	R		
Gaylussacia baccata (Wang.) K. Koch			
Black Huckleberry	R		
PHLOX			
Phlox maculata L.			
Wild Sweet William	R		
FIGWORT			
Mimulus glabratus HBK			
Monkey Flower	R		
ANIMAL KINGDOM			
AMPHIPODS			
Stygobromus heteropodus Hubricht	*R*		
CRAYFISH			
Orconectes harrisonii (Faxon)	*R*		
Orconectes quadruncus (Creaser)	*R*		
Orconectes hylas (Faxon)	*R*		

Table 2-7 Continued.

A N I M A L K I N G D O M

SPECIES	MO	IL	U.S. DEPT. INTERIOR
MILLIPEDES			
Zosteractis interminata Loomis	*R*		
FISHES			
Acipenser fulvescens Rafinesque Lake sturgeon	E	HV	
Scaphirhynchus albus (Forbes & Richardson) Pallid sturgeon	E	R	
Lepisosteus spatula Lacepede Alligator gar	R	HV	
Hybopsis gelida (Girard) Sturgeon chub	E	R	
Hybopsis meeki Jordan & Evermann Sicklefin chub	E	R	
Cycleptus elongatus (Lesueur) Blue sucker	R		
AMPHIBIANS			
Rana sylvatica sylvatica LaConte Eastern wood frog	E	R	
Gastrophryne carolinensis carolinensis (Holbrook) Eastern narrow-mouthed toad		R	
REPTILES			
Macroclemys temmircki (Troost) Alligator snapping turtle	R	R	
Pseudemys concinna hieroglyphia (Holbrook) X Pseudemys floridana hoyi (Agassiz) Slider		HV	

Table 2-7 Continued.

ANIMAL KINGDOM

SPECIES	MO	IL	U.S. DEPT. INTERIOR
Ophisaurus attenuatus attenuatus (Cope) Western slender glass lizard		R	
Masticophis flagellum flagellum (Show) Eastern coachwhip		HV	
Elaphe guttato emoryi (Baird & Girard) Great Plains rat snake		HV	
Pantilla grasilis hallowelli Cope Northern flat-headed snake		HV V	
Sistrurus catenatus catenatus (Rafinesque) Eastern massasanga	R		
Crotolus horridus horridus Winnaeus Timber rattlesnake		V	
BIRDS			
Haliaeeius leucocephalus leucocephalus (Linnaeus) Southern Bald eagle	EX	E	E
Haliaeeius leucocephalus alascensis Northern Bald Eagle	R	E	
Ictinia misisippiensis (Wilson) Mississippi kite	R	V	
Falco peregrinus anatum American peregrin falcon	E	E	E

Table 2-7 Continued.

A N I M A L K I N G D O M

SPECIES	MO	IL	U.S. DEPT. INTERIOR
Botaurus lentiginosus (Rackett) American bittern		V	
Florida caerulea (Linnaeus) Little blue heron		V	
Ixobrychus exilis (Gmelin) Least bittern		V	
Nyctanassa violacea (Linnaeus) Yellow-crown night heron		V	
Nyctanassa nycticorax (Linnaeus) Black-crown night heron		V	
Anas acuta Linnaeus *Pintail*		V	
Anas rubripes Brewster Black duck		V	
Aythya valisineria (Wilson) Canvasback		V	
Spatula clypeata Northern shoveler		V	
Lanius ludoviscianus Linnaeus Loggerhead shrike		V	

Table 2-7 Continued.

ANIMAL KINGDOM			
SPECIES	MO	IL	U.S. DEPT. INTERIOR
MAMMALS			
Corynorhinus rafinesquii (LeConte) Big-eared bat	E		
Myotis grisescens Howell Gray bat	E	HV	E
Myotis keenii (Merriam) Keen's bat	R		
Myotis sodalis Miller & Allen Indiana bat	E	E	E
Lutra canadensis (Schreber) River otter	E	V	
Mustela frenata Lichtenstein Long-tailed weasel	R		
Sylvilagus aquaticus (Bachman) Swamp rabbit	R		

E - Endangered - This term is defined by law and indicates that the species has been designated by either the U.S. Department of the Interior (Federally Endangered) or by the states of Missouri and Illinois (State Endangered). Federally endangered species are in danger of extinction throughout all or a significant portion of their entire range. A state endangered species is one whose prospect for survival within the state is in immediate jeopardy.

HV - Highly Vulnerable - Species which are in immediate danger of extirpation as a breeding species in the state, but not necessarily throughout their entire range.

V - Vulnerable - Species which are likely to become highly vulnerable in the state in the foreseeable future as a breeding population.

Table 2-7 Concluded.

R - Rare - Species that although not presently threatened with extirpation, are in such small numbers within the state that it could easily become endangered.

SU - Status Undetermined - Species that have been suggested by competent authority as possibly rare or endangered, but about which there is not enough information to determine its status.

EX - Extirpated - Species that formerly occured in the state, but at this time are not known to exist there.

R - Presumed to be rare within state.

Sources - Holt, et.al. (1974), Lopinot and Smith (1973), U.S. Department of the Interior, Fish and Wildlife Service (1974), Illinois Nature Preserves Commission and IL Dept. of Conservation (1976), U.S. Army Engineer District, St. Louis, Missouri (1976), and U.S. Department of Interior (1976 a. and b.)

2.2.4 PESTIFEROUS PLANTS AND ANIMALS

Among the pestiferous plants and animals known or thought to occur in the Kaskaskia Island project area are one plant, many invertebrate species or groups, one mammal, and representatives of two families of snakes.

Poison ivy (Rhus radicans) was a conspicuous plant in many areas of Kaskaskia Island. It formed one of the chief understory plants in the flood plain forest of the unprotected flood plain, occurred along roadside ditches, and even along the exposed banks of the Mississippi River. Contact with any part of this plant may produce severe allergic reactions in individuals sensitive to its sap.

Four of the invertebrate pests are probably more common in the upland forests along the bluffs on the Illinois and Missouri sides of the Mississippi River. They can, however, be transported either because of their association with humans (as with the brown recluse spider) or movements of man or animals from upland areas down to the flood plain areas.

The brown recluse spider (Loxosceles reclusa Gertsch & Muliak) favors the upland forest habitats, but may be present on Kaskaskia Island because of its association with man. It produces a painful bite which is very slow to heal. The black widow spider, Latrodectus mactans (Fabricius) also prefers upland forest situations, but may be a possible inhabitant of the island.

Two ticks, Dermacentor variabilis (Say), the wood tick, and Amblyomma americanus (Linnaeus), the lonestar tick frequent the upland forests in the higher elevations on either side of the Mississippi River. Both species may be carriers of rocky mountain spotted fever. This disease is caused by the pathogen Rickettsia rickettsii. In addition, the lonestar tick is also the vector for tularemia (Pasteurella tularensis). Both diseases while infrequent can be fatal to man.

Diptera are pests to man and livestock, especially biting midges (Ceratopogonidae), black flies (Simuliidae), and mosquitoes (Culcidae). Deer flies (Tabanidae) and robberflies (Asilidae) also produce painful, itching bites. Representatives of all these families were observed on Kaskaskia Island. Mosquitoes may be potentially harmful to man and livestock through their transmittal of encephalitis-producing ultra-microscopic viruses. These viruses are solely carried by mosquitoes. All these insects, except the Asilidae, have immature states which are aquatic.

The striped skunk (Mephitis mephitis) could at times be considered a pest to man and animals because of its defensive, offensive spraying, and possibility of carrying rabies. However, because of its diet of rodents and insects it is probably more beneficial than it is a pest. The Crotalidae, the venomous snakes in the project area, are water moccasin (Agkistrodon piscivorus leucostomus), copperhead (Agkistrodon contortrix mokeson and Agkistrodon contortrix contortrix) eastern massasauga (Sistrurus catenatus catenatus), and timber rattlesnake (Crotalus horridus horridus). These individuals can inflict bites which are potentially fatal to man, but because of their diet they are beneficial in controlling the rodent population. Also the eastern massasauga is listed as rare in Missouri and the timber rattlesnake is listed as vulnerable in Illinois (Table 2-7). These individuals are very secretive and are not often seen by casual observers.

2.3 SOCIO-ECONOMIC ELEMENTS

2.3.1 GENERAL

This portion of the report is concerned with establishing baseline conditions necessary to subsequently detail socio-economic impacts that alternate plans for flood control on Kaskaskia Island entail. Analysis focuses on two areas - Kaskaskia Island; and areas adjacent to the island that may be affected via secondary impacts of some of the alternatives considered. Sources used to develop information on baseline conditions include the Census of Population, studies on the economic and cultural features of Kaskaskia Island undertaken by Dr. Doyne Horsley of the Department of Geography, Southern Illinois University, Carbondale, and a population survey and land ownership study undertaken by the St. Louis District, Corps of Engineers.

A number of factors have interacted to produce the social environment of Kaskaskia Island. Most significantly, and as its name states, Kaskaskia Island is physically isolated from both Missouri and Illinois. In the early 1880's, the Mississippi River changed its course taking over the lower stretch of the Kaskaskia River and severing what is now Kaskaskia Island from the rest of Illinois. The old river channel on the west became a swampy slough and effectively isolated the island from Missouri as well. Only one all-weather road to the island exists, a one-lane bridge connecting the island to St. Mary's, Missouri. The island officially and administratively, however, remains part of Illinois.

Another important factor in the social environment of Kaskaskia Island is its historical heritage. The original town of Kaskaskia, destroyed when the river changed its course, was the site of the first state capitol of Illinois and a seat of French Colonial Culture long before the founding of the United States (see section 2.3.8, Historical Elements). The Catholic Church of the Immaculate Conception on the island is the direct descendant of the church founded by Father Marquette in 1675, and is the oldest active parish in the Midwest.

The isolation and the unique historical heritage of Kaskaskia have acted to produce a strong sense of awareness and pride in being a Kaskaskian. The social characteristics examined below reflect these factors.

2.3.2 DEMOGRAPHIC ELEMENTS

Most residents of Kaskaskia Island live in two small villages - Kaskaskia and Pujol. Table 2-8 presents population figures for Kaskaskia Island. As can be seen, the island's population has been declining over the last several decades. The decrease reflects two forces - first, the movement away from rural areas which has occurred on a national scale, and second, the floods. Although 1973 was the first time that the levee had been overtopped, previous floods have caused enough invonvenience to encourage some residents to relocate.

One-half of the population of Kaskaskia Island is below 29.7 years of age. This figure is lower than the 1970 median for Randolph County of 32.7 years. While the median indicates a relatively young population living on the island, the figure is somewhat misleading. As Figure 2-1 shows, the typical resident of the island is most likely to be either very young or else an older adult; relatively few residents in their middle years reside on the island.

The majority of the residents on Kaskaskia Island are native born islanders or have married into a native family. Of the residents recently surveyed, 49 or 89.1 percent were either native to the island or were married to a native. In this situation, little migration among the residents is apparent; however, a number of migration patterns have been operative. The 1973 flood was a major impetus for out-migration. The island was completely devastated and residents were forced to occupy temporary housing established in nearby communities. Most residents have now returned to the island; however, fear of future flooding and a shortage of habitable structures on the island have kept others off. Based on interviews with island residents, it can be assumed that additional former residents would return if flood protection were increased and the housing situation improved; however, others have purchased new homes and established new lives in surrounding areas and would not be likely to return to the island. Kaskaskia Island is an attractive retirement site for past residents, and most of the island's more recent immigrants fall into this category. This trend is likely to continue; information supplied by the Kaskaskia Island Citizens Committee indicates that 54 individuals reside on the island on weekends or for vacations; a portion of these are anticipating moving to the island upon retirement.

Only two families of the 60 recently surveyed were both newcomers to the island (i.e. locating on the island since the 1973 flood) and non-natives.

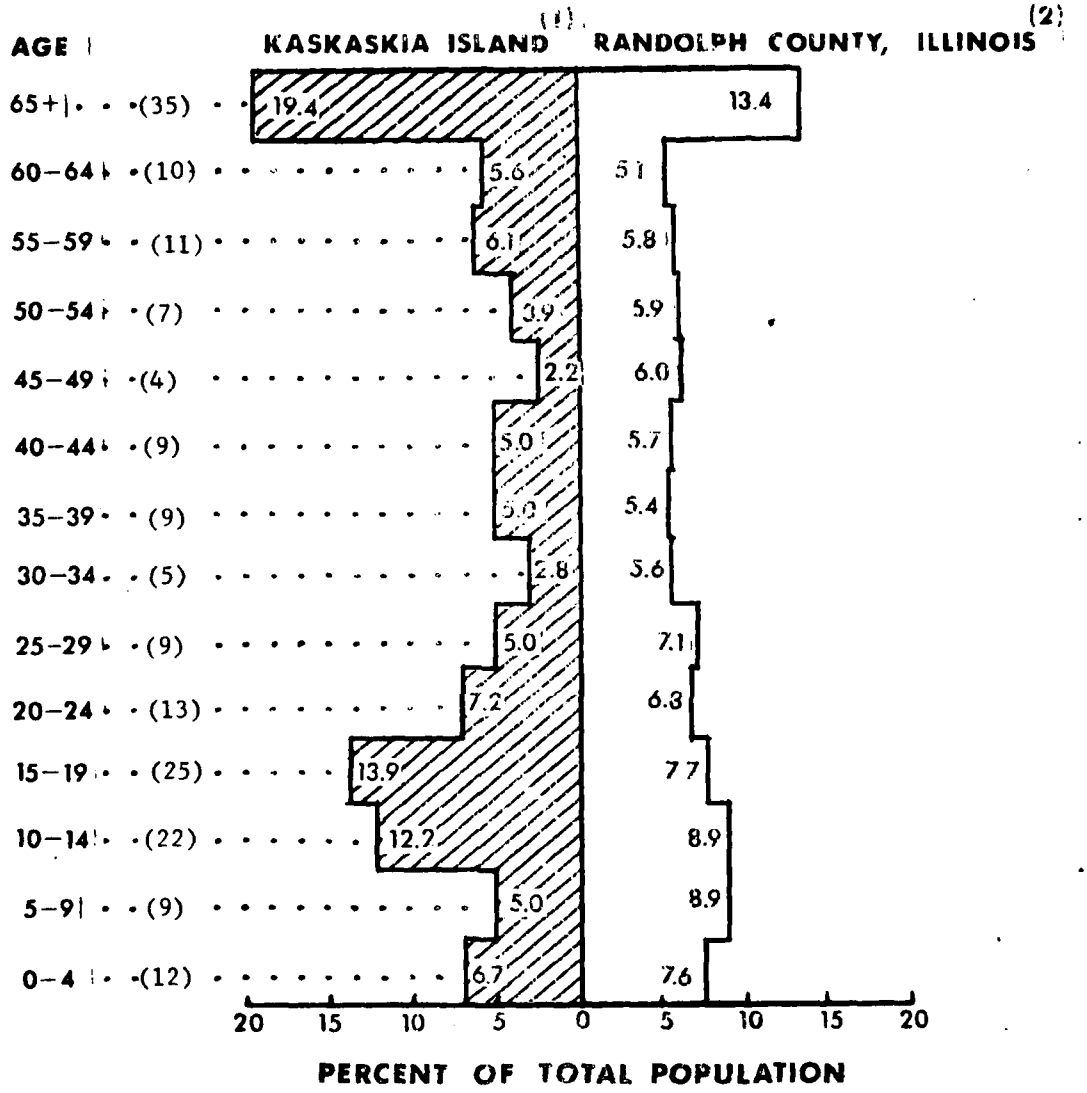
Table 2-8 Kaskaskia Island Population, 1930-1976.

Year	Population	Year	Population
1930	560	FLOOD OF 1965	
1940	642	1970	293
FLOOD OF 1943		FLOOD OF 1973	
1945	500	Nov. 1974	188*
FLOOD OF 1957		Feb. 1975	200*
1957	390	Jun. 1976	233*
1960	369		
FLOOD OF 1961			
1962	340		

*Figures supplied by Kaskaskia Island Citizens' Committee.

Source: Horsley, 1976.

Figure 2-1. AGE STRUCTURE, KASKASKIA ISLAND, ILLINOIS



Source: (1) Kaskaskia Island Population Survey, May 1976
(2) U.S. Census of Population, 1970

NOTE: Numbers in parentheses are actual population totals in age cohorts

2.3.3 ECONOMIC PROFILE

The economy of Kaskaskia Island is primarily agricultural with approximately 7,000 acres inside the levee planted in corn, wheat, and soybeans (Table 2-9). Prior to the 1973 flood, there were three businesses, - one bar and two grocery stores - on the island, but as of May 1976, none of these had reopened.

Of the island's residents fifteen families (29 percent) have a farmer as the principal wage earner. Farming accounts for over one-half annual family income for 20 island families (39 percent). A considerable number of residents commute off the island to jobs with the Prince Gardner wallet factory in St. Mary's, Missouri and the lime kiln in Ste. Genevieve, Missouri being major employers.

2.3.4 LAND TENURE

Information on land ownership patterns on Kaskaskia Island was obtained in order to answer a number of questions that related to the continued ability of the Kaskaskia Island community to survive. These questions were (1) what proportion of land owners are absentee landlords? (2) how has this population changed over the past 20 years?, and (3) have floods contributed to the character and velocity of land transactions on the island? Land ownership pattern data were obtained from a search of records in the Randolph County Courthouse. From this study, it was concluded that absentee landowners own 45.8 percent of island land inside the levee. In examining Land Sales records, for the past 20 years, it can be concluded that both the number of absentee landowners and the acreage owned by this category of owner has decreased. Plotting the number and type of land sales against flood and non-flood years discloses no apparent relationship (Figure 2-2). A biserial correlation coefficient of .06 for flood years and land scale activity confirms this observation. Flooding does not therefore appear to be directly related to the pattern or velocity of land sales on Kaskaskia Island.

2.3.5 COMMUNITY COHESION

Perhaps as a function of their relative isolation and their perception of the historical heritage of Kaskaskia Island, residents identify very strongly with the island.

Residents like the peaceful, unhurried pace of life on the island and are convinced that the island's isolation contributes to the quality of life. The peace and solitude offered by the island were often mentioned as being attractions for living there, however, other factors were also cited. Residents feel that their children receive a better education on the island than they could anywhere else. The island's elementary school has 3 teachers and 29 students in grades K-8, and emphasizes personalized instruction (older students are bused off the island to Chester, Illinois to attend high school).

Table 2-9 Kaskaskia Island acreage and yields, 1969-1973[1]

	1969	1970	1971	1972	1973
Corn (ac)	2982	2421	4641	2900	352
Yield (bu/ac)	85	80	80	80	87
Wheat (ac)	1390	1308	1617	2114	2568
Yield (bu/ac)	51	45	44	42	No harvest
Soybeans (ac)	1575	1450	1320	1575	1427
Yield (bu/ac)	30-35	30-35	30-35	30-35	30-35
Total Acres:	5947	5179	7578[2]	6649	4347[3]

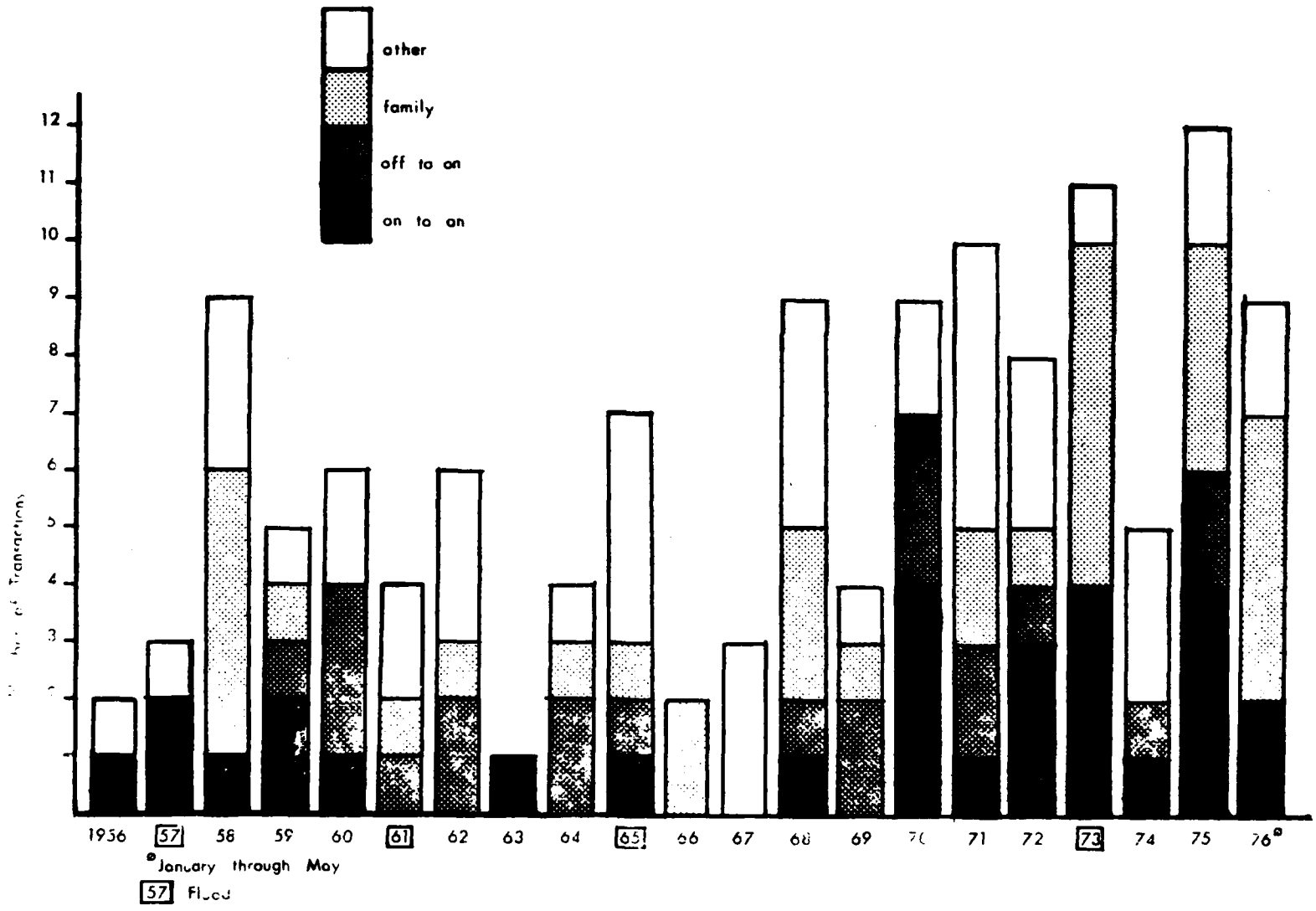
1. More recent figures not available because federal acreage set-aside programs which compile statistics were not in effect for above crops in 1974 and 1975.

2. 1971 was a very dry year, and areas normally too wet could be cultivated.

3. Year of flood.

Source: Agricultural Stabilization and Conservation Service, Randolph County as reported in Sverdrup and Parcel, 1976.

Figure 2-2. KASKASKIA ISLAND LAND TRANSACTIONS, 1956-1976



Residents are very conscious and proud of being Kaskaskia islanders; as such, this status is not easily acquired. As several residents noted in interviews, a person almost has to be born on the island to be accepted as an islander. As a corollary to this observation, several of those interviewed who were not native indicated initial difficulty in making friends on the island.

In addition to being linked together by their emotional ties to the island, many residents are linked by kinship ties. Intermarriage among island families has been common, and a complicated web of kinship lines exists. Almost all residents of the island know each other by name, and it can be assumed that friendship patterns are well-established on the island.

The unique characteristics of Kaskaskia Island - its defineable boundaries, isolation, historical heritage, and social interrelationships and interdependancies - have interacted to produce a very close-knit and cohesive society on the island. Residents obviously derive great satisfaction in living on the island, and make sacrifices in the form of foregoing accesibility and to some extent safety in order to do so.

2.3.6 THE SOCIAL IMPACT OF THE 1973 FLOOD

The flood of 1973 which completely innundated Kaskaskia Island has had profound impacts on island residents. These impacts include the out-migration of substantial numbers of island residents, the personal loss of property and savings by most residents, and physical and psychological stress incurred by many residents in adapting to the vicissitude of the flood and its aftermath.

The out-migration of a substantial portion of the island's population has affected the entire community. Friendships and visiting patterns were no doubt disrupted as were subjective assessments by residents as to the quality of life on and off the island. While property losses on the island were covered in part by insurance and federal disaster relief funds, in most instances, residents still incurred substantial financial setbacks from the flood. Homes and farms that had taken a lifetime to build were completely destroyed, and these of course, could not be replaced simply by an infusion of federal aid. Financial setbacks produced by the flood in some cases have causes residents to alter their life plans.

Studies of natural disasters have detailed the physical and psychological stresses incurred by victims of such occurrences. (Grossner, et. al. 1964, Quarantelli and Dyres, 1970, Drabek, et. al. 1975, Wolf, 1975). The 1973 flood seems to have produced effects similar to those noted in the literature. Several residents interviewed

cited instances where island residents had to be placed under sedation in the flood's aftermath, and others reported problems with ulcers and feelings of anxiety which they attributed to readjustment recessitated by the flood. In some instances, these problems still recur particularly when the river begins to rise.

Given the impacts of the flood on the island's residents, it might be presumed that most individuals would have been reluctant to return to the island. As noted previously, this has not been the case. While some residents have reported problems with stress related to fear of future floods, most residents discount the probability of another flood of the magnitude of the 1973 flood pointing to the fact that 1973 was the only time the levee has ever been overtopped. Residents further rationalize their decisions to remain on the island by comparing the threat of flooding with that of tornadoes and noting that people do not relocate to avoid tornadoes.

Rationalizations aside there is no question that a flood of the character of that which occurred in 1973 would destroy the community of Kaskaskia Island. The decision of those that have returned to the island was in large measure based on the fact that a flood of 1973's magnitude had not occurred since the present levee was constructed. If the levee were to be overtopped once more, this justification would no longer be convincing and personal economic hardships would practically dictate the permanent evacuation of the island. The social character of the Kaskaskia community would, of course, be destroyed with the dispersal of island residents in the surrounding area.

2.3.7. ADJACENT AREAS

2.3.7.1. ST. MARY'S, MISSOURI

This small town (1970 population, 645) is situated on a low terrace directly west of Kaskaskia Island. The town and the island are somewhat intertwined economically. The only all weather road to the island runs through St. Mary's. Most residents on Kaskaskia Island shop in St. Mary's for groceries and minor purchases. Island farmers ship much of their grain via the terminal in St. Mary's. Though higher in elevation, the city of St. Mary is also situated in a flood prone area. The flood of 1973 completely inundated the central business district; in addition, 25 to 30 homes and the community grade school were also flooded (Southeast Missouri Regional Planning Commission (SEMORPC), 1974).

2.3.7.2 STE. GENEVIEVE, MISSOURI

The town of Ste. Genevieve (1970 population 4,468) is something of a commercial center for surrounding smaller communities. Residents of Kaskaskia Island reported that they utilize Ste. Genevieve for

making major purchases. The city is not protected from flooding by any federal levees and in 1973 suffered heavy damage. Approximately 130 homes and 50 businesses were damaged in the flood, (SEMORPC, 1974).

Total damages of the 1973 flood in Ste. Genevieve County which contains both the cities of Ste. Genevieve and St. Mary's were estimated at approximately $10,000,000 by SEMORPC.

2.3.8 HISTORICAL ELEMENTS

A portion of the French Colonial Historic District, a National Register property, is located on the north-eastern corner of Kaskaskia Island. This district encompasses the original site of Kaskaskia and commemorates the historic legacy of the town. In addition to the National Register District, properties of potential historical significance include the Church of the Immaculate Conception in Kaskaskia Village and the so-called "Liberty Bell of the West" a bell cast in France in 1941 which is also located in Kaskaskia Village.

2.3.9 ARCHAEOLOGICAL RESOURCES

Forty-three historic and prehistoric archaeological sites are located in areas adjacent to potential levee alinements. As presently designed, the project will affect thirteen sites by partial or total nonaqueous burial under two to five feet of noncontaminated soil used for the interior seepage berm at the foot of the levee. Three of these thirteen sites are in the French Colonial Historic District and are on the National Register of Historic Places. An additional six sites are in areas where they will be totally or partially removed by borrow pits. In all, nineteen sites will be affected in some way by the project as now designed.

The ten sites to be affected by nonaqueous burial and the six sites to be affected by borrow pits, all of which lie outside the French Colonial Historic District, will be tested for National Register significance and have determinations of National Register eligibility submitted to the Office of the National Register. If sites are deemed eligible for inclusion in the National Register, appropriate mitigation measures will be conducted prior to disturbance by the project.

Information on the sites and the extent of survey has been communicated to the Illinois State Historic Preservation Officer (SHPO) and to the National Park Service, Interagency Archaeological Services - Atlanta Office (NPA-IAS-Atlanta). Comments of the SHPO and NPS-IAS-Atlanta appear in Appendix B to this EIS.

2.3.10 NATIONAL REGISTER RESOURCES

A portion of the French Colonial Historic District, a property on the National Register of Historic Places is located on Kaskaskia Island. Nine of the archaeological sites located in the survey are located within the boundaries of this District, and as such can be

considered to be National Register properties. Of these sites three are adjacent to the levee alinement of the proposed plan and will be subjected total or partial nonaqueous burial as discussed in paragraph 2.3.9., above.

The Illinois SHPO has been asked to make a determination of effect for the three archaeological sites to be affected by the levee berm fill. The SHPO's letter of 26 April 1977, see Appendix B to this EIS, has indicated that no historic or architectural effect will take place in the French Colonial Historic District. The SHPO's response to the request for a determination of effect on the three archaeological sites in the French Colonial District is not available at this writing. However, appropriate procedures will be undertaken if the effect is determined to be adverse.

2.3.1.1 OUTDOOR RECREATION

An inventory of outdoor recreation areas in Randolph and Ste. Genevieve counties was performed for this environmental statement. Based on National Recreation and Park Association standards for outdoor recreation space and population size, the counties inventoried have adequate regional parkland, but have a shortage of local, neighborhood and community parks.

Currently, Kaskaskia Island has no publicly owned local parkland for its 233 residents. However, due to the low population density, it is possible that a local park would not have an adequate population to effectively utilize its facilities. This is especially so since there are several existing factors which help to compensate for the deficiency of a local parkland. Second, the school grounds and facilities, when used as a gathering place or a playground, temporarily serve some of the functions of a local park. Third, the Catholic Church and parsonage along with the Bell Memorial and surrounding grounds comprise something of a quasi-public neighborhood park for the community of Kaskaskia.

In addition to these factors, the part of Kaskaskia Island situated outside the levee consists of swampy areas, sloughs, and bottomland forests. These areas, are heavily used by island residents for hunting and fishing and constitute a valuable outdoor recreation resource for the local population. Since these areas are privately owned, access to these river resources are limited mainly to island residents and other locals.

2.4 FUTURE ENVIRONMENTAL SETTING AND NATURAL RESOURCES WITHOUT THE PROJECT

2.4.1 PHYSICAL ELEMENTS

2.4.1.1 GEOLOGICAL ELEMENTS

The projected future of the Kaskaskia Island Drainage and Levee District without the project will involve natural and man-made changes in the landscape. The levee will be overtopped periodically with the erosional and depositional forces of the Mississippi River unleashed to deposit sand and silts and erosion of new swales or the scouring of old channels. Man will continue to level, fill, channel, drain and alter the natural landforms and wetlands for the better and more efficient production of food and fiber.

2.4.1.2 SOILS

The soils of this intensively developed agricultural area will continue to be manipulated by man for maximum crop production. With rising agricultural product demand and rising commodity prices, the landowner may be expected to place as many acres of idle land in crops as possible. When the Island is flooded, the river will cover some fields with less fertile sands and deposit finer silts and clays in the existing swales as the flood waters recede and the energy cycle is lessened.

2.4.2 BIOLOGICAL ELEMENTS

The areas of marsh and sloughs will continue to fluctuate with wet and dry years and frequent flooding of woodlands, outside the levee along the Old River and Mississippi River, will continue to discourage clearing of these areas for agriculture. The use of fertilizers and pesticides for agriculture will remain similar to what it is at present, resulting in no increase of these chemicals in the runoff. Access to the area for hunting and fishing will remain limited.

2.4.3 CULTURAL ELEMENTS

In the absence of any Corps of Engineers project - and in the absence of any severe floods - Kaskaskia Island will continue to be a viable community. The character of the age structure which shows a large proportion of the island's population in young age cohorts, the availability of some employment opportunities within easy commuting distance to the island, and the strong attachment of island residents of all ages for the island supports this condition. The relative lack of suitable housing on the island, the scarcity of

land for housing, and the threat of flooding, however, are all factors which should effectively limit interest in the island as a place for non-islanders to locate. In this situation, it can be expected that the island's population could approximate its 1970 total of 293 within the next ten years. Growth beyond this level during the 50-year planning focus of this study is not anticipated.

Other social characteristics considered in this section are similarly not expected to change from present conditions.

3. THE RELATIONSHIP OF THE PROPOSED ACTION TO LAND USE PLANS

A comprehensive plan for Randolph County, Illinois was completed in 1965 and later adopted by the county. This plan recommends that Kaskaskia Island be preserved for intensive agricultural use since its soils are some of the most fertile in the county. The proposed levee raise is in harmony with this planning objective.

Improved flood protection on Kaskaskia Island will increase agricultural production through allowing harvests in those years where the flood occurrence would overtop the existing levee and yet be contained by the proposed levee. In years where the flood occurrence exceeds that of the existing levee and is below the flood span of the proposed levee, only partial damage of the crops will result due to seepwater rather than almost total destruction from flooding. Enlarged gravity drains are also being installed. This measure will improve drainage throughout the levee district and allow some of the swales which are now cultivated only in dry years to become permanent or nearly permanent fields. Also, when the district is covered with either seep or flood water, the land will drain faster, possibly in time for late plantings of soybeans or fall plantings of winter wheat. The amount of agricultural land being destroyed for construction purposes will be more than offset by the increased yields of the remaining protected acreage as discussed above.

The Village of Kaskaskia was identified as being flood prone by the Federal Insurance Administration, Department of Housing and Urban Development in December of 1973. The Village of Kaskaskia is participating in the emergency phase of the National Flood Insurance Program. This entitles homeowners in the village to purchase up to $17,500 in flood insurance on a single family residence and up to $5,000 on the contents. This available amount will double when a flood insurance study is completed and the Village of Kaskaskia becomes a full participant in the regular program. In order for Kaskaskia to participate in the regular program, they will be required to adopt ordinances regulating new construction in special flood hazard areas. These regulations will not allow construction in the floodway, and construction in the floodway fringe area will have the first floor above the 100-year flood elevation. These restrictions will have a definite impact on residential land use in Kaskaskia as the entire village is within the special flood hazard area. New construction would be discouraged in many areas and would possibly deter some from building on the island.

4. THE PROBABLE IMPACT OF THE PROPOSED ACTION ON THE ENVIRONMENT

4.1. IMPACT ON PHYSICAL ELEMENTS

4.1.1. IMPACT ON GEOLOGICAL ELEMENTS

There is a possibility that after the study area has greater protection from river flooding that more leveling and filling of the ridge and swale topography will take place. In other words, with better protection, the agricultural community is more prone to invest capital to modify the landscape for production of food and fiber.

The swales, which contain ponded water, will be dry more often due to the installation of larger gravity drains. The project will not affect water which enters the swales due to ground water flooding (seep water) during high water levels on the river.

4.1.2. GROUND WATER

The ground water table will continue a rise-fall sequence in response to the levels of the near-by river and should not be affected by either construction or non-construction of the proposed project.

4.1.3. IMPACT ON HYDROLOGIC ELEMENTS

The raising of the present levee and the replacement of the gravity drains with larger drains will provide flood protection from the Mississippi River to about the once in 50-year event and will provide improved drainage for interior runoff during periods of low river stages. Therefore, flood damages will be reduced. The flow in the Mississippi River will not be measurably changed due to the project. However, between elevations of the present top of levee and the proposed top of levee, flood heights in Ste. Genevieve and St. Mary's will be increased slightly due to the project.

4.1.4. IMPACT ON WATER QUALITY

During construction of the new levee water quality in the adjacent Mississippi and Old Rivers and sloughs, will be temporarily impacted by increased suspended solids and turbidity in the runoff from the area. More long-term secondary impacts may result from intensified agricultural activities allowed by the project. Such activities would increase nutrients from fertilizers and toxins from pesticides in the runoff into the Old River and sloughs, adding to the pollution load of the Mississippi River. Also, the larger gravity drains will increase the amount and flow rate of runoff from the island increasing its ability to transport pollutants.

4.2. IMPACT ON BIOLOGICAL ELEMENTS

4.2.1. IMPACT ON AQUATIC COMMUNITIES

Some fish, benthos, and plankton may suffer temporary adverse impacts from increased turbidity and suspended solids and resulting sedimentation in the adjacent Mississippi and Old Rivers and sloughs due to runoff from the areas being excavated. Aquatic organisms may also suffer long-term secondary impacts because of degradation of water quality from intensification of farming practices allowed by the project.

Most of the existing 148 acres of marsh habitat and 73 acres of oxbow pond landward of the levee will probably be lost due to improved drainage by the enlarged gravity drains and one lowered gravity drain at the northeast corner of the island. Areas of standing water will still remain, however, during periods when the gravity drains are closed by high river stages. The duration with which water will remain on the protected portion of the island will be considerably reduced. Also, flow through some of the slough and ditches on the island may increase during periods of runoff, due to better drainage by the enlarged drains.

The 11 borrow pits riverward of the levee necessary to furnish material for construction of the new levee will create 472 acres of aquatic habitat, which is considered as offsetting the losses of aquatic habitat inside the levee due to increased drainage efficiency. The life expectancy of most of the borrow pits will probably be only 10 to 20 years due to siltation, when they are inundated by backup in the Old River from the Mississippi River. However, four of the borrow pits, totalling 140 acres in size and located northwest of the island will have considerably longer life spans because they will be protected from flooding by levees. A 16-foot strip around the inside of each borrow pit will be planted with marsh plantings consisting of Chufas, Arrowhead, Hardstem Bulrush, River Bulrush and Sago Pondweed. The entire 472 acres of borrow pits will be seeded, the first year with Japanese Millet, to furnish food for waterfowl. This will stabilize the banks and reduce the amount of suspended solids entering them from runoff which should aid in lengthening their life.

4.2.2. IMPACT OF TERRESTRIAL COMMUNITIES

During construction, the existing vegetation will be removed from the old levee and adjacent interior area. These areas are mainly in grasses and agriculture with a few trees around gravity drains. The new levee would be seeded with a mixture of sod-forming grasses, which would replace that lost from the present levee.

No significant impacts to the woodlands of the area are anticipated since most of the woodlands are confined to riverward of the levee along the Old River and adjacent to the Mississippi River. Since this area will only be affected by borrow pits, limited to agricultural land, little natural vegetation and wildlife habitat will be lost. As was mentioned under the section on aquatic impacts, the life expectancy of these borrow pits will only be 10 to 20 years due to siltation, with the exception of three northwest of the island, separated from the river by levees.

The existing marsh areas (148 acres) landward of the levee serve as waterfowl habitat and also support a population of muskrats when water levels allow. Most of these areas would probably be eventually lost due to improved drainage by the enlarged gravity drains. Areas of standing water would still remain, however, during periods when the gravity drains are closed by high river stages. The duration with which water will remain on the protected portion of the island will be considerably reduced. The loss of wetlands would have an adverse impact on the breeding and migratory waterfowl, wading birds, aquatic reptiles, amphibians, and aquatic mammals that use them. It has been noted by Graber (1976) that these wet areas, by concentrating fish in late summer, provide important feeding areas for young herons. Graber continues to state that drainage of wetlands along with destruction of large bottomland trees used for nesting, threatens the existence of herons in the Mississippi Valley in Southern Illinois. As stated in Part 4.2.1., the creation of 472 acres of aquatic habitat outside of the levee system is considered as more than offsetting these losses.

4.2.3. IMPACT ON RARE AND ENDANGERED SPECIES

Kaskaskia Island is not known to contain critical habitat for any species considered threatened or endangered nationally. However, it is possible that two species, the perigrine falcon and the southern bald eagle, occasionally stray into the area. Also Indiana bats and gray bats could possibly feed in the area. Table 4-1 summarizes the impacts of the project on specific species on the National (Fish and Wildlife Service, 1974) and Illinois (Illinois Nature Preserves Commission and Illinois Department of Conservation, 1976) lists of rare and endangered species. No species on either list depends upon habitat on Kaskaskia Island for survival, but it must be kept in mind that most endangered species are in difficulty because of the loss of habitat, and, consequently, all remaining habitat for endangered species must be considered important.

Table 4-1

IMPACTS TO RARE and/or ENDANGERED SPECIES OF THE U. S. AND ILLINOIS

Species	IL	U.S. Dept. Interior	Impact of Project Features 1	2	3	4
FISHES						
Lake sturgeon	HV					
Pallid sturgeon	R					
Alligator gar	HV				B	B
Sturgeon chub	R					
Sicklefin chub	R					
Blue sucker						
AMPHIBIANS						
Eastern wood frog	R					
Eastern narrow-mouthed toad	R					
REPTILES						
Alligator snapping turtle	R			A	B	B
Slider	HV			A	B	B
Western slender glass lizard	R					
Eastern coachwhip	HV					
Great Plains rat snake	HV					
Northern flat-headed snake	V					
Timber rattlesnake	V					

Table 4-1 Continued

Species	IL	U.S. Dept. Interior	Impact of Project Features 1	2	3	4
BIRDS						
Southern Bald eagle	E	E			B	B
Northern Bald eagle	E				B	B
Mississippi kite	V				B	B
American peregrin falcon	E	E				
American bittern	V					B
Little blue heron	V			A	B	B
Least bittern	V					
Yellow-crown night neron	V			A	B	B
Black-crown night neron	V			A	B	B
Pintail	V				B	B
Black duck	V				B	B
Canvasback	V				B	B
Northern shoveler	V				B	B
Loggerhead shrike	V					
MAMMALS						
Gray bat	HV	E				
Indiana bat	E	E				
River otter	V				B	B

Impact: A - Possible adverse
B - Possible beneficial
Blank Space - No significant impact

Status: E - Endangered
HV - Highly Vulnerable
V - Vulnerable
R - Rare

Project Features:

1. Levee raise
2. Increase size of gravity drains to improve interior drainage.
3. Borrow pits used for aquatic habitat.
4. Wildlife plantings around borrow pits.

4.2.4. IMPACT ON PESTIFEROJS SPECIES

The project will have very little impact on pestiferous plants and animals. However, the improved drainage of the interior of Kaskaskia Island due to the enlarged gravity drains will aid in vector control by eliminating areas of standing water used by mosquitoes for reproduction, but this may be offset by wetlands created by the borrow pits outside the levee.

4.3 SOCIO-ECONOMIC IMPACTS

4.3.1. SOCIAL IMPACT

4.3.1.1. POPULATION

The levee raise, by providing a higher degree of flood protection, will encourage some former residents to return to the island. In addition, it can be expected that the island, with greater flood protection, may attract new residents who are drawn to the island for its natural beauty, peace and quiet, and other amenities. The magnitude of any population increase that is attributable to levee construction is not expected to be large, however. The high agricultural value of the island land and the consequent reluctance of farmers to sell building lots, as well as the availability of non-agricultural land for home building that is safe from flooding in nearby areas, are factors which limit the islands development potential. Given these facts, the population increase on the island with the levee could be expected to increase to 350 by 2030. This figure represents a projected increase of 57 persons over the no-project scenario.

4.3.1.2. RELOCATION

In order to accommodate the larger levee and seepage berms, three homes located adjacent to the existing levee will be relocated. Structures will either be razed or moved to other locations on the island. Residents will receive compensation and relocation assistance.

4.3.1.3. COMMUNITY COHESION

In Section 2, it was demonstrated that Kaskaskia Island is a very close-knit community. It was further noted that levee raise will provide greater protection from flooding and by doing so, will provide additional support for maintaining the viability of Kaskaskia Island as a community. There are other factors which certainly cast a shadow on Kaskaskia Island's future as a community, e.g., outside land ownership and the pull of employment opportunities for younger residents; however, the major factor in the long term

ability of the community to survive is protection from flooding. The project will provide protection from floods of approximate 50-year frequency or lower. In addition, the levee will be designed in such a way that in the event it is overtopped by a less frequent flood, i.e., 50+ years, the turbulence and resulting wave wash that destroyed much of the island in 1973 would be reduced. The project, while not guaranteeing the future of the community of Kaskaskia Island, is a necessary condition for its continued viability. As such, the project makes a definite, positive contribution to the maintenance of community cohesion.

4.3.1.4. EMPLOYMENT

The project, by providing approximate 50-year protection, will provide farmers on the island with more security from floods which could curtain agricultural production. Over the long term, a greater number of crops produced can be expected with the levee raise than without. Given this situation, the project will enhance employment opportunities for island agricultural workers to a limited degree.

4.3.1.5. AGRICULTURAL PRODUCTION

Construction of the levee will remove 328 acres of agricultural land from production. The loss of this land will be offset by the greater protection from flooding provided to the remaining cropland.

4.3.1.6. TAXES

Currently, island landowners are assessed a tax on property owned of 50¢ per acre to operate and maintain the existing levee. Construction of a new levee will result in an increase in this tax rate in order to pay for the local share of the project. As is apparent, major landowners will be most affected by such an increase in their taxes.

4.3.1.7. SECURITY

While the project will provide protection to Kaskaskia Island from floods of about 50-year or less frequency, it is important to note that floods of less frequency can certainly be expected. Because of levee design, such floods are not anticipated to be as damage-producing as the 1973 flood; however, they will still place great stress and hardship on the residents of Kaskaskia Island. The community of Kaskaskia Island is in a flood-prone area, and while greater protection will be achieved, some danger of flooding still exists. Residents must evaluate this prospect against the enjoyment and satisfaction that come from living on the island.

4.3.2. IMPACT ON OUTDOOR RECREATION

The interior of the borrow pits used for construction of the levee will be surrounded by a 16 foot wide strip of marsh plantings, creating 44 acres of marsh habitat. The 11 borrow pits will provide approximately 472 acres of aquatic habitat for about the first 20 years after project completion. After the 20 years, 7 of the borrow pits (332 acres) will probably be lost to siltation due to inundation during high stages of the Mississippi River. These areas will still probably remain low and wet, but during dry years cultivation will be allowed in them. Four of the borrow pits (140 acres) that are protected by levee will remain for the entire 100 year life of the project. These areas will enhance the recreation activities of hunting and fishing. But since they will remain in private ownership, they will primarily benefit local residents and the use per acres will remain about the same.

4.3.2.1. TANGIBLE BENEFITS FOR HUNTING

The only benefits deriving from preservation of fish and wildlife habitat that can be quantified ar those associated with the "consumptive" uses of wildlife resources, hunting and fishing. Since the project will not affect the private ownership of the island, access will still remain limited and the use of the island for hunting will not increase. Also very little terrestrial habitat will be created or destroyed, so no recreational benefits for the use of the land for hunting can be claimed.

4.3.2.2. TANGIBLE BENEFITS FOR FISHING

Annual fishing benefits valued at $5,000 would be derived from the creation of fish habitat in the project area. The calculations of future use were based on the fact that the lands would remain in private ownership, the use per acre per year would remain the same, and the only increase in fisherman use would be the result of increased acres of habitat. An estimate of 10 fisherman-day per acre per year on Kaskaskia Island was selected as a reasonable approximation. The estimated present use was subtracted from the estimated future use. The difference was then multiplied by an assumed dollar amount per fisherman-day to arrive at the total dollar benefits accruing from the project (Table 4-3). Since the project was authorized on 23 October 1962 prior to 25 October 1973, it does not fall under the jurisdiction of the Water Resources Council Related Land Resources, Principles and Standards (Federal Register, 10 September 1973). Because of this fact, Supplement No. 1 to Senate Document 97, which established a range of recreation unit values from $.50 to $1.50 per day, was used. The value of $1.50 was used for the value of a fisherman day.

Table 4-2 Fishing Benefits

Present Use

290 Acres of Oxbow Ponds X 10 Fisherman-Days Per Acre =

2,900 Fisherman-Days X $1.50 = $4,350

Future Use

290 Acres of Oxbow Ponds X 10 Fisherman-Days Per Acre =

2,900 Fisherman-Days X $1.50 = $4,350

139 Acres of Protected Borrow Pits X 10 Fisherman-Days =

1,390 Fisherman-Days X $1.50 = $2,085

333 Acres of Unprotected Borrow Pits with estimated useful life = 20 years

X 10 Fisherman-Days Per Acre = 3,330 Fisherman-Days

X $1.50 = $4,995 per year for 20 years.

Present worth of $4,995 a year for 20 years @ 3¼% = $4,995 X 14.54 (present worth factor) = $72,627. Annual benefits over 100 year project life @ 3¼% = $72,627 X .03388 = $2,461

Total $8,896

Future Use		$8,896
Present Use		$4,350
Increased Use		$4,546
	Use	$5,000

4.3.3. IMPACT ON CULTURAL RESOURCES

4.3.3.1. HISTORICAL RESOURCES

The levee project will provide a greater degree of protection for the Church of the Immaculate Conception and the historic bell and monument on the island.

4.3.3.2. ARCHAEOLOGICAL RESOURCES

Raising the levee has the potential for affecting nineteen archaeological sites discovered in the survey performed for the project. Of these, only three are located in the French Colonial Historic District. These three sites plus ten sites outside the French Colonial Historic District are being affected solely by nonaqueous burial. An additional six sites, all outside the French Colonial Historic District may be partially or totally affected by borrow pits.

Prior to any construction of the project, the sites noted above will be tested. Information on those sites that appear to meet National Register eligibility criteria, as well as those already on the Register, will be presented to the Illinois State Historic Preservation Officer (SHPO) in coordination with the Advisory Council on Historic Preservation and via the Advisory Council Compliance process (36 CFR 800) an appropriate plan of mitigation for these resources will be developed.

If, during the construction phase of the project, undiscovered archaeological resources are encountered, work will be redirected until appropriate archaeological evaluation on materials can be made.

4.3.3.3. NATIONAL REGISTER PROPERTIES

The proposed levee will pass through the southwestern corner of the French Colonial Historic District. The levee will follow the same alinement as the existing levee and will not cause any appreciable changes in visual or aesthetic impact. Three archaeological sites that will be buried by levee construction are located in the District and as such, are on the National Register. Coordination with the SHPO and Advisory Council will be effected to mitigate potential adverse impact of the project on this resource.

4.3.4. IMPACT ON ADJACENT AREAS

4.3.4.1. ST. MARY's MISSOURI

The levee raise will have secondary impacts on this community. The limited enhancement of agriculture and agricultural employment that the project will produce for the island should be felt in St. Mary's since most island residents shop there and island farmers market their grain in the community. The project in raising the

levee height on the island will also produce a raise in flood heights in St. Mary's of approximately 0.6 feet for floods higher than the present levee, but below the proposed height on the new levee. This increase in flood height, while minimal, can still be expected to produce some additional adverse economic and social impacts on the community that would not have occurred in without project conditions. Economic damages to the town produced by increased flood heights are projected to amount to $3,000.00 annually.

4.3.4.2. STE. GENEVIEVE, MISSOURI

The character of secondary impacts on this community are very similar to those described above. The positive economic benefits from the project will be felt in Ste. Genevieve as Kaskaskia Island residents make purchases in Ste. Genevieve. The increased levee heights, however, is expected to increase flood heights in Ste. Genevieve approximately 0.6 feet for floods higher than the present height of the Kaskaskia Island levee, but below the proposed new levee's height. Again, any increase in flood heights can be expected to produce added adverse economic and social impacts in Ste. Genevieve. Economic damages to the town produced by increased flood heights are projected to amount to $7,000.00 annually.

5. ANY PROBABLE ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

5.1. ADVERSE PHYSICAL IMPACTS

Flood heights in the range between the 10-and 50-year frequency floods will be increased (about 0.6 feet at St. Mary's Missouri and 0.6 feet at Ste. Genevieve, Missouri) due to the levee raise project. This increase will affect flooding in St. Mary's and Ste. Genevieve. Table 5-1 shown water surface elevations at different locations at various frequencies of flooding for both existing and with project conditions. The effect becomes less further upstream and at about river mile 145 (29 river miles upstream of Kaskaskia Island) there will be no effect on the profiles.

During construction of the new levee water quality in the adjacent Mississippi and Old Rivers and sloughs, will be temporarily impacted by increased suspended solids and turbidity in the runoff from the area. More long-term secondary impacts may result from intensified agricultural activities allowed by the project. Such activities would increase nutrients from fertilizers and toxins from pesticides in the Old River and sloughs, adding to the pollution load of the Mississippi River. Also, larger gravity drains will increase the amount and flow rate of runoff from the island increasing its ability to transport pollutants.

5.2. ADVERSE BIOLOGICAL IMPACTS

Some fish, benthos, and plankton may suffer temporary adverse impacts from increased turbidity and suspended solids and resulting sedimentation in the adjacent Mississippi and Old Rivers and sloughs due to runoff from the areas being excavated. Aquatic organisms may also suffer long-term secondary impacts because of degradation of water quality from intensification of farming practices allowed by the project.

During construction, the existing vegetation will be removed from the old levee and adjacent interior area. These areas are mainly in grasses and agriculture with a few trees around gravity drains. The new levee would be seeded with a mixture of sod-forming grasses, which would replace that lost from the present levee.

Most of the existing 148 acres of marsh habitat and 73 acres of oxbow pond landward of the levee would probably be lost due to improved drainage by the enlarged gravity drains. Areas of standing water would still remain, however, during period when the gravity drains are closed by high river stages. The duration with which water will remain on the protected portion of the island will be considerably reduced. Also, flow through some of the slough and ditches on the unprotected flood plain may increase, during periods of runoff, due to better drainage of the island by the enlarged gravity drains.

TABLE 5-1
INCREASED FLOOD HEIGHTS

LOCATION Mississippi R Miles above the Mouth of Ohio R.	25-YEAR FREQUENCY			50-YEAR FREQUENCY			100-YEAR FREQUENCY		
	w/o Project	w/Project	Diff	w/o Project	w/Project	Diff	w/o Project	w/Project	Diff
109.5 (Chester)	383.5	383.5	0	386.7	386.7	0	389.3	389.3	0
113 *(St. Marys)	387.7	388.0	+0.3	390.8	391.4	+0.6	393.2	393.2	0
122.8 (Ste. Genevieve)	390.2	390.3	+0.1	392.2	393.0	+0.6	394.8	395.4	+0.6
136.0 (Brickeys Ldg.)	398.0	398.0	0	400.6	400.7	+0.1	403.1	403.4	+0.3
145.7 (Selma)	403.8	403.8	0	406.8	406.8	0	409.4	409.4	0

*Elevations shown at St. Marys, Missouri are the water surface elevations in the old channel as determined by model testing.

The loss of wetlands would have an adverse impact on the breeding and migratory waterfowl, wading bird, aquatic reptiles, amphibians, and aquatic mammals that use them. The creation of wetland areas from borrow sites utilized during construction will serve to offset these losses and provide more of this valuable habitat type.

5.3. ADVERSE CULTURAL IMPACTS

Construction of the levee will remove 328 acres of agricultural land from production. The loss of this land will be offset by the greater protection from flooding provided to the remaining cropland. In order to accommodate the larger levee and seepage berms, three homes located adjacent to the existing levee may have to be relocated. Structures will either be razed or moved to other locations on the island. Residents will receive compensation and relocation assistance.

Raising the levee has the potential for affecting 19 archaeological sites discovered in the survey performed for the project. Prior to any construction of the project, the sites will be tested. Information on those sites that appear to meet National Register will be presented to the Illinois State Historic Preservation Officer (SHPO) in coordination with the Advisory Council Compliance process (36 CFR 800) an appropriate plan of mitigation for these resources will developed.

If, during the construction phase of the project, undiscovered archaeological resources are encountered, work will be redirected until appropriate archaeological evaluation on materials can be made.

The proposed levee will pass through the southwestern corner of the French Colonial Historic District. The levee will follow the same alignment as the existing levee and will not cause any appreciable changes in visual or aesthetic impact. Three archaeological sites that will be buried by levee construction are located in the District and as such are on the National Register. Coordination with the SHPO and Advisory Council will be effected to mitigate any adverse impact of the project on this resource. No historic or architectural impacts are taking place in the French Colonial District (see paragraph 3.2.10).

The levee raise will have secondary impacts on St. Mary's Missouri. the project of raising the levee height on the island will produce a raise in flood heights in St. Mary's of approximately 0.6 feet for floods higher than the present levee, but below the proposed height on the new levee. This increase in flood height, while minimal, can still be expected to produce some additional adverse economic and social impacts on the community that would not have occurred in with-out project conditions.

The increased levee heights is expected to increase flood heights in Ste. Genevieve approximately 0.6 feet for floods higher than the present height of the Kaskaskia Island levee, but below the proposed new levee's height. Again, any increase in flood heights can be expected to produce added adverse economic and social impacts in Ste. Genevieve.

6. ALTERNATIVES TO THE PROPOSED ACTION

Prior to project authorization, various comprehensive flood protection plans were evaluated. The term "comprehensive" as used here refers to the concept of providing increased protection to all, or portion of the Ste. Genevieve agricultural area as well as Kaskaskia Island. Due to lack of economic justification and local support from the Ste. Genevieve District, these comprehensive plans have been discarded in favor of protection of Kaskaskia Island only.

Included among the alternatives considered for reduction of flood damages on the island were the structural measures of constructing a riverside levee raise and enlargment with different crown width, levee raise with and without increased gravity drain sizes, and the non-structural measures of purchasing all structures on the island with continued private ownership and farming of the land, purchasing the entire island for development and management as a wildlife area, purchasing the island for a combination leaseback for agriculture and management of wildlife, and the no action alternative. During the Phase I reevaluation, three alternative plans were developed in detail, a National Economic Development (NED) Plan, an Environmental Quality (EQ) Plan, and the Selected Plan. The NED Plan was developed with the objectives of preventing flood damages and optimizing net economic benefits. The EQ Plan was developed with the objectives of reducing flood damages in the project area, while emphasizing preservation, creation, and enhancement of fish and wildlife habitat and minimizing social impacts. The Selected Plan is the plan chosen to best meet the project purposes while taking into consideration both economic and environmental concerns and the needs of the project area.

6.1. NED PLAN

The NED Plan is similar to the Selected Plan as described in Section 1, but consists of only a 4-foot landward side levee raise. Flood protection would be increased to the level of an approximate 25-year frequency flood. This would be a 4-foot levee grade reduction below the authorized levee raise of 8-feet. The plan would also include enlarged gravity drains to improve interior drainage. The levee right-of-way would require 156 acres on the landside of the levee and 24 acres riverward of the levee. Borrow areas would take 240 acres, 71 acres protected by the Ste. Genevieve No. 2 Levee and 169 acres along the Old Channel. Because the levee raise would be in the agricultural land landward of the levee, and the borrow pits located in agricultural land outside the levee, very little fish and wildlife habitat would be affected. Also, marsh plantings would be included around the interior of the borrow pits.

This plan provides the greatest economic benefits over cost so it has been designated the NED Plan. The economic benefits of this structural alternative would be derived from reduced crop and property damage by increasing flood protection and interior drainage and reduced emergency flood expenditure and repair costs.

6.2. EQ PLAN

Based on careful plan evaluation, the selected EQ Plan combines environmental and social concerns with the consideration of needs of the project area.

6.2.1. ALTERNATIVE EQ PLANS

The following alternative EQ Plans applicable to the study area were considered.

6.2.1.1. PURCHASE ISLAND AND LEASE BACK FOR AGRICULTURE

Kaskaskia Island would be purchased and the residents and historical sites relocated off the island. The existing levee would be maintained by the Corps of Engineers and the tillable land leased back for agricultural purposes. The existing fish and wildlife habitat would be preserved in its existing condition. Because the land use on the island would remain the same with only the loss of residential and historical features, little fish and wildlife habitat would be lost.

6.2.1.2. PURCHASE ISLAND AND MANAGE FOR WILDLIFE

The island would be purchased and the residents and historic sites relocated off the island. It would be allowed to return to a natural state with no land being leased for agriculture and the levee would not be maintained. The 9,069 acres of agricultural and urban land now protected by the Kaskaskia Island levee would revert over a period of time to bottomland forest, swamp, and slough habitat characteristic of Mississippi River Flood Plain. With some management by the Illinois Department of Conservation, this would result in a considerable gain in fish and wildlife habitat in the area.

6.2.1.3. PURCHASE ISLAND FOR A COMBINATION OF LEASING FOR AGRICULTURE AND MANAGEMENT FOR FISH AND WILDLIFE

Kaskaskia Island would be purchased and the residents and historic sites would be relocated off the island. The existing levee would be maintained by the Corps of Engineers. Portions of tillable land would be leased back for agricultural purposes interspersed with areas of wildlife management designed to return to bottomland forest swamp, marsh, and slough habitat characteristic of the Mississippi River Flood Plain. Such interspersion of a food and cover and aquatic and terrestrial habitat with a considerable amount of edge will result in a very high quality fish and wildlife habitat. Kaskaskia Island is in a good location to become an ideal stopover area for waterfowl using the Mississippi Flyway and appropriate management practices by the Illinois Department of Conservation would do much to enhance the area for this purpose.

6.2.1.4. RAISE LEVEE WITH NO INCREASE IN GRAVITY DRAIN SIZES AND WITH FISH AND WILDLIFE MANAGEMENT

There would be a landside raise of the existing levee with no increase in size of the gravity drains. The existing woodlands and sloughs along the Old River and Mississippi River would be preserved by purchasing and managing for fish and wildlife. Marshes landward of the levee would be preserved because of no increase in gravity drain sizes. The borrow pits would be located and shaped in such a manner as to enhance their use by fish and wildlife. Futher enhancement would also result from wildlife plantings around the borrow pits and along the inside of the seepage berm.

6.2.2. EQ PLAN SELECTION

In developing a plan for flood control on Kaskaskia Island that emphasized the enhancement of environmental concerns, there was much to commend the choice of a non-structural approach which would have relocated Kaskaskia Island residents off the island and managed portions of the island for wildlife purposes without raising the levee. In this manner, substantial Federal costs would be prevented for constructing a new levee and the possibility of the commitment of other Federal funds for disaster relief of island residents in the event of a 50 year flood removed.

Other factors are also involved, however, which complicate the decision. The concept of environment as interpreted under the National Environmental Policy Act of 1969 includes social as well as biological dimensions. As such, under the environmental enhancement objective concern for social needs of the project area population is an appropriate area for study just as much as are biological needs.

Kaskaskia Island is a rather unique community because it is isolated, highly cohesive, and a great degree of community satisfaction is displayed among residents. While the community has other problems, the major threat to its future is flooding. Given these two factors, the major question becomes, is it worth the expenditure of public funds to protect this community even though the plan does not absolutely preclude the possibility that additional Federal funds for disaster relief in the event of a 50+ year flood might be needed? The available evidence on the viability of the community and the quality of life manifested on the island suggests that a plan emphasizing the social environment meets the scope of the EQ objective. With these factors in mind the EQ plan was developed. Both social and wildlife habitat needs are included in the plan making tradeoffs where appropriate.

6.2.3. DESIGNATED EQ PLAN

Due to the previously mentioned important historic, cultural, and social aspects of preserving a viable community on Kaskaskia Island a structural alternative was chosen for the EQ Plan. The major features of the selected EQ Plan are described below.

6.2.3.1. STRUCTURAL ACTION

The existing levee would be raised approximately 8 feet in order to protect the island against a once in about 50 year flood. The enlargement would occur on the landward side of the levee, preserving the fish and wildlife habitat on the riverward side. Material for construction of the levee would be supplied from borrow pits in agricultural land riverward of the levee, located in such a way as to protect existing fish and wildlife habitat, and archaeological sites. The existing gravity drains would not be enlarged, but rather, only extended because of the new wider levee.

6.2.3.2. PRESERVATION AND ENHANCEMENT OF FISH AND WILDLIFE HABITAT

Wildlife and wildlife habitat have been disappearing at a very rapid rate from flood plains, due mainly to development and flood control attempts. For this reason existing woodlands and wetlands along the Mississippi and Old Rivers, the Old River itself, and existing marshes on the island would be maintained. No additional land would be cleared for agriculture or any other reason. To help assure this, 2,957 acres of bottomland forest outside the levee would remain uncleared; it would be purchased, managed for fish and wildlife, and opened to public use for hunting and fishing. All borrow pits would be located riverward of the levee in agricultural land, that is subject to flooding from the Mississippi River or the Old River. Such locations would considerably lessen the loss to wildlife habitat and wetlands. These borrow pits would be constructed and shaped in such a manner that they would provide good fish and wildlife habitat. A thirty-foot strip around each pit would be seeded with a game plot mixture of grasses, legumes, and small shrubs (130 acres). This would provide wildlife food and cover an also stabilize the banks of the borrow pits which would aid in lengthening their life. The borrow pits (472 acres), along with the surrounding wildlife plantings, would be protected against plowing or any other cultivation by purchasing and management for fish and wildlife. A 60 foot wide, 14.8 mile long (108 acres) corridor around the inside of the seepage berm would be purchased and planted with similar mixtures of grasses, legumes, and small shrubs as used around the borrow pits. This area would also be managed by the Illinois Department of Conservation. No clearing of woodlands would be allowed inside the levee except what is necessary for construction of the levee. Also since the gravity drains would only be extended to reach through the wider levee and not enlarged, the marsh land and existing areas of standing water (approximately 148 acres of marsh and 73 acres of oxbow ponds) would remain.

6.3 SELECTED PLAN

The Selected Plan, as described in more detail in Section 1, consists of an approximate 8-foot landward side levee raise to increase flood protection to the level of an approximate 50-year frequency flood. Because the levee raise would be in the agricultural land landward of the levee, and the borrow pits located in agricultural land outside the levee, very little fish and wildlife habitat would be affected. The Selected Plan in addition would incorporate enlarged gravity drains, which would improve interior drainage, and 16-foot wide strips of marsh plantings around the inside of the borrow pits.

6.4. NO ACTION

In all resource developments, the alternative of taking no action must be studied and addressed. Without the project the levee will be overtopped more frequently with the erosional and depositional forces of the Mississippi River acting to deposit sand and silts and erode new swales or scour old channels. The soils of this intensively developed agricultural area will continue to be manipulated by man for maximum crop production.

The areas of marsh and sloughs will continue to fluctuate with wet and dry years and frequent flooding of woodland outside the levee will continue to discourage clearing of these areas for agriculture. The use of fertilizers and pesticides for agriculture will remain similar to what it is at present, resulting in no increase of these chemicals in the runoff. Access to the area for hunting and fishing will remain limited.

The relative lack of suitable housing on the island, the scarcity of land for housing, and the threat of flooding should limit the island's population to near its 1970 total of 293. Growth beyond this level during the 50 year planning focus of this study is not anticipated. Other social characteristics are similarly not expected to change from the present condition.

6.5. SUMMARY

The impacts of the EQ, NED, and Selected Plan and No Action Alternative are summarized in Table 6-1.

Table 6-1 System of Accounts

Environmental Quality

*Items specifically mentioned in Section 122 of P.L. 91-611

1. Impact is expected to occur prior to or during implementation of the plan.
2. Impact is expected within 15 years following plan implementation.
3. The uncertainty associated with the impact is 50% or more.
4. The uncertainty associated with the impact is less than 10%.
5. Impact will occur with implementation.
6. Impact will occur only when specific additional actions are carred out during implementation.

	NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE *WITHOUT* PROJECT
A. Environmental Quality Enhanced					
1. *Man-Made Resources	Increase flood protection from 10 *year to approximate* 25 year frequency (1,4,5)	Increase flood protection from 10 *year to approximate* 50 year frequency (1,4,5)	Increase flood protection from 10 year to approximate 50 year frequency (1,4,5)	None	None
2. *Natural Resources	Increase flood protection for 8,162 acres of cropland (1,4,5) Increase crop production (2,4,6)	Increase flood protection for 8,054 acres of cropland (1,4,5) Increase crop production (2,4,6)	Increase flood protection for 8,162 acres of cropland (1,4,5) Increase crop production (2,4,6)	Increase fish and wildlife productivity on 9,069 acres (2,4,6)	None
3. Pollution Aspects					
a. *Air	*None*	*None*	*None*	*None*	*None*

	NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
3. Pollution Aspects (continued)					
b. *Water	Some reduction in suspended solids in runoff due to stabilization of soils by limited marsh plantings (1,4,5)	Reduce suspended soils in runoff due to stabilization of soils by wildlife plantings (1,4,5)	Some reduction in suspended solids in runoff due to stabilization of soils by limited marsh plantings (1,4,5)	Reduce suspended solids, nutrients, and pesticides in runoff due to stabilization of soils by wildlife plantings and reduction of agricultural activities (1,3,5)	None
c. Land	None	None	None	Reduce dumping on the island (1,6,9)	None
4. Ecosystem					
a. Aquatic Habitat	Create 240 acres from borrow pits (169 acres will remain for approximately 20 years and 71 acres will last for the life of the project (1,4,5)	Create 472 acres from borrow pits (332 acres will remain for approximately 20 years and 139 acres will last for the life of the project) preserve 148 acres of marsh and 73 acres of oxbow pond (1,4,5)	Create 472 acres from borrow pits (332 acres will remain from approximately 20 years and 139 acres will last for the life of the project (1,4,5)	Create additional habitat (1,4,5)	None
b. Terrestrial Habitat	None	Create 108 acres along inside of seepage berm, 130 acres around borrow pits, and protect 2,957 acres of bottomland forest outside the levee	None	Create additional habitat (1,4,5)	None

Table 6-1 Continued

	[illegible] AN	E.I PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
B. Environmental Quality Degraded					
1. *Man-Made Resources	3 residences and 3 farm sheds relocated (1,4,5)	3 residences and 3 farm sheds relocated (1,4,5)	3 residences and 3 farm sheds relocated (1,4,5)	All residences and historic artifacts (1,4,5)	None
2. *Natural Resources	Temporary loss of 169 acres of cropland outside levee (1,4,5)	None	Temporary loss of 332 acres of cropland outside levee (1,4,5)	None	None
.. Pollution Aspects					
a. *Air	Temporary impacts from construction activities (1,3,5)	Temporary impacts from construction activity (1,3,5)	Temporary impacts from construction activities (1,3,5)	None	None
b. *Water	Temporary impacts from increase in suspended solids in runoff during construction (1,3,5) Long-term nutrients and pesticides in runoff from intensified farming (2,3,6)	Temporary impacts from increase in suspended solids in runoff during construction (1,3,5) Long-term secondary impacts from nutrients and pesticides in runoff from intensified farming (2,3,6)	Temporary impacts from increase in suspended solids in runoff during construction (1,3,5) Long-term nutrients and pesticides in runoff from intensified farming (2,3,6)	None	None
c. Land	None	None	None	None	Continued use of acres outside levee as trash dumps

Table 6-1 Continued

				NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
[illegible]					
a. Aquatic Habitat	[illegible] approximately 148 acres of marsh and 73 acres of oxbow pond (2,3,5)	None	Possible loss of approximately 148 acres of marsh and 73 acres of oxbow pond (2,3,5)	None	None
b. Terrestrial Habitat	None	None	None	None	None
[illegible] Environmental Unit Destroyed					
1. *Man-Made Resources	None	None	None	All residences and historic artifacts relocated off island (1,4,5)	None
2. *Natural Resources	156 acres of cropland lost inside levee. 71 acres of cropland lost outside the levee (1,4,6)	452 acres of cropland outside levee. 446 acres of cropland outside levee (1,4,5)	188 acres of cropland lost inside levee. 140 acres of cropland lost outside the levee (1,4,6)	Approximately 8,054 acres of cropland lost (1,4,6)	None
3. Pollution Aspects					
a. *Air	None	None	None	None	None
b. *Water	None	None	None	None	None
c. Land	None	None	None	None	None

Table 6-1 Continued

	NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
4. Ecosystem					
a. Aquatic Habitat	Possible loss of approximately 148 acres of marsh and 73 acres of oxbow pond (2,3,5)	None	Possible loss of approximately 148 acres of marsh and 73 acres of oxbow pond (2,3,5)	None	None
b. Terrestrial Habitat	None	None	None	None	None

Social Well-Being

	NEW NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
A. Beneficial Impacts					
1. *Population Growth	No beneficial impact to Kaskaskia Island	Increases to 350 by 2030	Increases to 350 by 2030	No beneficial impact to Kaskaskia Island	Population projected to increase to 293 by 2030
2. Migration	No beneficial impact to Kaskaskia Island	In-migration of retired age-groups; out-migration of young reduced	In-migration of retired age-groups; out-migration of young reduced	No beneficial impact to Kaskaskia Island	In-migration of retired age groups; out migration some younger groups
3. Community Cohesion	No beneficial impact to Kaskaskia Island	Enhanced; additional security from flooding provided, population structure stabilized.	No beneficial impact to Kaskaskia Island	No beneficial impact to Kaskaskia Island	Remains high
4. *Employment Opportunities	No beneficial impact to Kaskaskia Island	8,054 acres of cropland protected to approximate 50 year flood	8,162 acres of cropland protected to approximate 50 year flood.	No beneficial impact to Kaskaskia Island	9,069 acres of cropland protected to 1(year flood
5. *Safety	Residents have approximate 25 year flood protection	Island residents have approximate 50 year flood protection	Island residents have approximate 50 year flood protection	Relocated island residents free from fear of flooding	Island resident have 10 year flood protecti(
6. Public Outdoor Recreation Provided	0 acres	3,667 acres	0 acres	15,747 acres	0 acres

Social Well-Being (continued)

	NEW NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
7. Adjacent Areas					
a. St. Mary's, MO	No beneficial effect	Economic benefits to town as Kaskaskia Island experiences population growth	Economic benefits to town as Kaskaskia Island experiences population growth	Housing marked in St. Mary's stimulated as displaced residents of Kaskaskia Island seek new homes	No change in existing conditions
b. Ste. Genevieve, MO	No beneficial effect	Slight economic benefits to town as Kaskaskia Island experiences population growth	Slight economic benefits to town as Kaskaskia Island experiences population growth	No beneficial effect	
c. Chester, IL	No beneficial effect	Slight economic benefits to town as Kaskaskia Island experiences population growth	Slight economic benefits to town as Kaskaskia Island experiences population growth	No beneficial effect	
B. Adverse Impacts					
1. *Population loss	No adverse effect	No adverse effect to Kaskaskia Island	No adverse effect to Kaskaskia Island	Population reduced to zero	
2. Migration	No adverse effect	No adverse effect to Kaskaskia Island	No adverse effect to Kaskaskia Island	Out-migration of entire population	
3. *Displacement	3 households moved due to levee construction	3 households moved due to levee construction	3 households moved due to levee construction	Entire population displaced	
4. *Community Cohesion	No adverse effect	Island residents and landowners negatively view additional visitors to island for outdoor recreation facilities	No adverse effect	Lost, with breakup of community	

	NED PLAN	EQ PLAN	SELECTED PLAN	NON-STRUCTURAL PLAN	FUTURE WITHOUT PROJECT
Social Well Being					
5. *Employment Opportunities	Loss of 420 acres of cropland due to levee construction	Loss of 898 acres due to levee construction and wildlife measures	Loss of 780 acres due to levee construction and wildlife measures	8,054 acres of cropland lost due to wildlife measures	
6. *Safety	Island residents unprotected from 25+ year flood	Island residents unprotected from 50+ year floods	Island residents unprotected from 50+ year floods	No adverse impact	
7. Outdoor Recreation Lost	No adverse impact	No adverse impact	No adverse impact	No adverse impact	
8. Adjacent Areas					
a. St. Mary's, MO	0.3 foot increase in flood heights produces slight increase in flood damages to town	0.6 foot raise in flood heights produces greater economic and social damages to town. Economic damages approximately $3,000 annually.	0.6 foot raise in flood heights produces greater economic and social damages to town. Economic damages approximately $3,000 annually.	Slight decline in sales of major purchase items as a portion of Kaskaskia Island residents relocate away from St. Mary's market area.	
b. Ste. Genevieve, MO	0.1 foot raise in flood heights produces slight increase in flood damages to town	0.6 foot raise in flood heights produces greater economic and social damages to town. Economic damages total approximately $7,000 annually	0.6 foot raise in flood heights producer greater economic and social damages to town. Economic damages approximately $7,000 annually.	Slight decline in sales of major purchase items as a portion of Kaskaskia Island residents relocate away from Ste. Genevieve market area.	
c. Chester, IL	No adverse impact	No adverse impact	No adverse impact	Slight decline in sales of major purchase items as a portion of Kaskaskia Island residents relocate away from Chester market area.	

*Categories of impact mentioned in Sec. 122 guidelines

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

The levee raise project on Kaskaskia Island will increase flood protection for 8,162 acres of crop land and the incorporated villages of Kaskaskia and Pujol from the existing protection against approximately a 10-year flood to protection against about a 50-year flood. The increased flood protection will enhance economic standard of living of those residents of the island over the short and long term. Specific measures have also been incorporated into the project to preserve and enhance fish and wildlife habitat, both for the benefit and use of the present generation and future generations.

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

A total of 328 acres of crop land on the inside of the leveed areas will be permanently lost due to construction of the landside levee raise, the seepage berm, and some unaboidable landside borrow. Also, about 148 acres of marsh and 73 acres of oxbow pond habitat inside the levee could possibly be lost because of improved drainage, resulting from increasing the size of the gravity drains.

9. COORDINATION WITH OTHERS

A summary of all pertinent correspondence relating to the formulation of the Selected Plan, and subsequent preparation of this Final Environmental Statement, is presented in the Final Phase I GDM, Appendix I.

The Draft Environmental Statement, along with the Draft DGM-Phase I, was furnished to the following agencies and interested citizens for review and comment:

Advisory Council on Historic Preservation
U.S. Department of Agriculture
  Forest Service
  Soil Conservation Service *
U.S. Department of Commerce
U.S. Department of Health, Education and Welfare
U.S. Department of Housing and Urban Development
U.S. Department of the Interior *
U.S. Department of Transportation
  Regional Representative of the Secretary *
  U.S. Coast Guard *
U.S. Environmental Protection Agency *
U.S. Federal Power Commission *
U.S. Energy Research Development Agency
U.S. House of Representatives
U.S. Senate
Governor of Illinois *
Governors Committee on Flood Control
State Clearinghouse
Illinois Archaeological Survey *
Illinois Department of Conservation *
Illinois Natural Resource Development Board
Board of Supervisors of:
  Randolph County, Illinois
  Ste. Genevieve County, Missouri
  Perry County, Missouri
Mayors of:
  Ste. Genevieve, Missouri
  St. Mary's Missouri
Kaskaskia Island Drainage and Levee District Commissioners
East-West Gateway Coordinating Council
Southeastern Missouri Regional Planning Commission
Southwestern Illinois Metropolitan Area Planning Commission
American Fishery Society, Illinois Chapter
Audubon Society
  National Audubon Society
  Audubon Society of Illinois
Migratory Waterfowl Hunters, Inc.

Coalition for the Environment
Environmental Defense Fund, Inc.
Environmental Response
The Coalition on American Rivers
The Izaak Walton League, Inc.
Sierra Club
    Ozark Chapter
    Piasa Palisades
The Wildlife Society, Illinois Chapter
Friends of the Earth
Advisory Board on National Parks, Historic Sites,
    Buildings, and Monuments
The Nature Conservancy, Illinois Chapter
Illinois Wildlife Federation
Ducks Unlimited
Dr. A.D. Horsley, Southern Illinois University
    at Carbondale, Dept. of Geography
Wagner, Bertrand, Bauman, & Schmieder,
    Attorneys at Law *

Comments on the Draft Environmental Statement were received from the sources indicated above by an asterisk (*). The St. Louis District's response to each comment is given in this section of the Environmental Statement. Copies of the letters of coordination are contained in Appendix C.

A number of those commenting on the Environmental Statement also commented on the GDM-Phase I in the same letter. Responses given here are limited to comments made in reference to the Environmental Statement. Comments made in reference to the GDM-Phase I have been responded to, as appropriate, in that document.

a. United States Department of Agriculture. Forest Service. (1 April 1977)

Comment 1: Page 25 shows a benefit/cost ratio of .59. If a favorable ratio is required at today's interest rate, it is difficult for us to see how the project could be endorsed. The use of excessively low interest rates served no useful purpose in determining the economics of a project.

Response: In the case of Kaskaskia Island, the project can be recommended, based upon a favorable benefit cost ratio of greater than unity using a 3 1/4 percent interest rate. A favorable benefit cost ratio at "today's interest rate" is not required. The 3 1/4 percent rate was used in compliance with planning guidance, which establishes the applicable interest rate as that in effect on the date of receipt of the original letter of intent from the project sponsor. Your concern over the economic impact that higher interest rates can have on the cost-benefit relationships is shared by many in our reviewing offices, in OMB and in Congress; and this is why we have presented this information in the report.

Comment 2: It appears that the long-term interests of the island residents and the general problems may best be served by selecting one of the nonstructural alternatives. Such alternatives should be looked at fully.

Response: Nonstructural alternatives for this project have been subjected to further examination since the draft project documents were forwarded for review. Benefits for the elimination of annualized crop and property damage have been withdrawn from the economic analyses of these plans. As a result of this action, the nonstructural alternative of purchasing only the structural features on the island will not be presented in the final report. The recreation benefits attributable to the alternative of using the island for wildlife management purposes have been reduced significantly. The benefit cost ratio of this alternative is now below unity. In addition to the aforesaid erosion of the economic benefits, the attractiveness of nonstructural alternatives is reduced further when one considers the fact that local interests are almost unanimously opposed to this concept since it involves their physical relocation. We feel that this opposition is strong enough to prevent implementation of any nonstructural plan which includes a requirement for relocating people.

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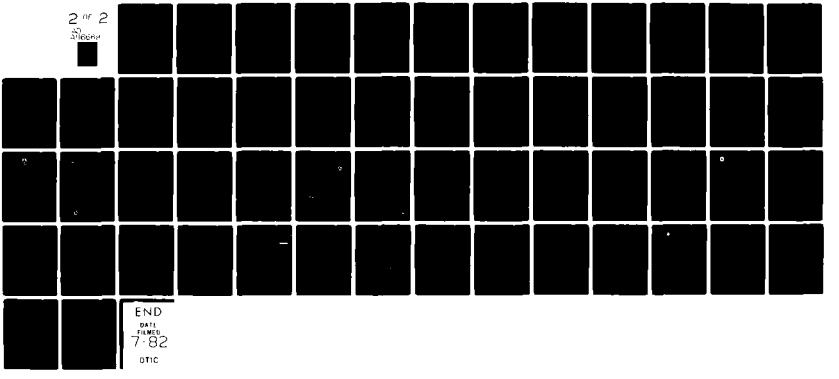

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b. United States Department of Agriculture. Soil Conservation Service. (21 March 1977)

Comment 1: Our Soil Scientists suggest changes in attached revised Table 2-1, Soil Classification Conversion Chart, page 8. These changes reflect updated information. If you have questions concerning these changes please contact Mr. Earl Voss, State Soil Scientist, USDA, Soil Conservation Service, P.O. Box 678, Champaign, Illinois 61820, telephone 217-356-3758.

Response: These changes have been made.

Comment 2: We believe consideration should be given to changing Table 4-1 which indicates that the rare wood frog (Rana sylvatica) will be benefited by the borrow pits and the wildlife plantings around the borrow pits. This seems unlikely since the wood frog is restricted to mesic forests in which these are permanent or semipermanent pools. The borrow pits and their associated wildlife plantings do not furnish this type of habitat.

Response: This change has been made.

Comment 3: Also, Sistrurus catenatus catenatus, listed in Table 2-7 as rare in Missouri, and Crotalus horridus horridus, listed as vulnerable in Illinois, are included in the section on pestiferous plants and animals. This seems contradictory. A discussion of vectors would seem appropriate in the environmental impact statement but the categorization of certain organisms as pests does not. The striped skunk listed in this section could just as well be considered beneficial because its diet includes rodents and insects. Likewise, snakes of the genus Natrix, while aggressive, are not dangerous and should not be classified as pests.

Response: This section has been rewritten.

c. United States Department of the Interior (14 April 1977)

Comment 1: We should state at the outset that the proposed raising of the levees at Kaskaskia Island is, in itself, not a complex proposal, nor one with which we are inclined to take great exception. Our later specific comments on the EIS and GDM are not extraordinary in any way. However, the Department of the Interior must question the manner in which the Corps of Engineers has classified certain alternative plans for the project. The selected plan--a structural proposal to raise the levees 8 feet and enlarge existing gravity drains to improve interior drainage--is termed an Environmental Quality (EQ) plan. The National Economic Development (NED) Plan would consist of purchasing the entire island for development and management as a wildlife area. This reversal of terminology appears to be a misinterpretation of the intent of the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources (Federal Register, 9/10/73).

Section II D of the Standards states that "The national economic development objective is enhanced by increasing the value of the nation's output of goods and services and improving national economic efficiency", and that "Components of the national economic development objective include: (a) The value of increased outputs of goods and services resulting from a plan...". This section goes on to enumerate increases in crop yields as an example of direct increases in the nation's output and the reduced disruption of economic activity due to floods as an example of "direct increases in productivity from water and land development that contribute to national output." The same section addresses the "EQ" objective: "The preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems in the area under study and elsewhere in the Nation. This objective reflects society's concern and emphasis for the natural environment and its maintenance and enhancement as a source of present enjoyment and a heritage for future generations." Components of the environmental objective are then listed as including "Management, protection, enhancement or creation of areas of natural beauty and human enjoyment..."; Management, preservation or enhancement of especially valuable or outstanding...biological (including fish and wildlife)...resources and ecological systems"; and "Avoiding irreversible commitments of resources to future uses...". Section V B of the Standards, titled "Plan Formulation-Specification of Components", further defines specific components

of the NED and EQ objectives. These and other parts of the Principles and Standards do not appear to conform with the classification or nomenclature you have adopted for your selected plan and NED plan.

Our concern is more with the precedent that may be set than with the specifics of the Kaskaskia Island project. We therefore, request an expanded discussion of the rationale used to classify the alternatives.

Response: According to existing regulations which interpret and clarify the basic "Principles and Standards" issued by WRC, "a National Economic Development (NED) plan addresses the planning objectives in the way which maximizes net economic benefits." The wildlife management plan discussed in the draft report met this test and was therefore designated the NED plan. The question has really been nullified, however, because we are now responding to guidance from our review authorities by reducing the unit value of a hunter-fisherman day (as you also suggested) and by eliminating the "Property Damage" benefit category. The net result of these changes will be to reduce the benefit-cost ratio below unity. The new NED plan will call for only a 4-foot increase in the height of the levee. To further clarify the issue you raised, I should point out that the Recommended Plan was not designated as an EQ plan in the draft report, although it did contain some EQ-oriented features and was consistent with the concept of dealing with the co-equal planning objectives.

Comment 2: The draft statement should be expanded to identify impacts on existing and potential recreation opportunities in the study area.

Response: Impacts on outdoor recreation were addressed in Section 4.3.2 IMPACT ON OUTDOOR RECREATION. Access to Kaskaskia Island for recreational purposes is limited to residents and other locals because of private ownership. The project will not change this situation, so it will probably have little impact on the public use of the island for recreation.

Comment 3: 1.3 Project Features. The project plan includes the replacement of existing gravity drains with larger drains. Will the replacement drains be installed at the same bottom elevations as the existing drains?

Response: All replacement gravity drains will be at the same elevation as the existing gravity drains, except the one at the northeast corner of the island (344.74). It will be lowered 1-1/2 feet to bring it to ground level.

Comment 4: 2.3.10 National Register Resources. We note on page 47 that nine archeological sites located within the French Colonial Historic District, an entry on the National Register of Historic Places, may be affected by the proposed action and that appropriate consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation is being conducted in accordance with the procedures set forth in 36 CFR Part 800.

Adherence to these procedures and implementation of official recommendations received will satisfy associated environmental and jurisdictional concerns of the U.S. Department of the Interior.

Response: Comment noted.

Comment 5: 2.3.11 Outdoor Recreation. This section indicates that Kaskaskia Island has no publicly owned parkland and that privately owned swampy areas, sloughs, and bottomland forests are used heavily for hunting and fishing by island residents. It is assumed that access to these lands is via privately owned lands. Access, if any, to river resources (boat launching) for fishing and hunting by residents and non-residents should be discussed.

Response: A statement has been added to indicate that access to the river resources on the island is limited to island residents and other locals because of private ownership.

Comment 6: 4.2.3 Impact on Rare and Endangered Species. Table 4-1 is an especially useful method of impact evaluation for rare and/or endangered species.

Response: Comment noted.

Comment 7: 4.3.2 Impact on Outdoor Recreation. This section indicates that wildlife plantings and certain borrow pits resulting from the project will enhance recreational opportunities. However, this section does not indicate whether any adverse impacts to recreation will result from the project. This section should discuss potential adverse impacts on recreation resulting from project implementation such as restricting river access and access to swamps, sloughs, and bottomland forests.

Response: Plans for the 130 acres of wildlife plantings were abandoned because of the cost of land acquisition and the inability to classify these areas as wetlands so they would fall under the provisions of Section 150 of P.L. 94-587, the Water Resources Development Act of 1976, which would provide funds for the creation

of wetlands. Instead of these plantings it is now planned to aid in creation of a wetland by planting wetland vegetation on a 16 foot wide strip around the inside of the borrow pit (44 acres). These plantings are described in more detail in Section 1.3, PROJECT FEATURES. A statement has been added to Section 4.3.2, IMPACT ON OUTDOOR RECREATION, indicating that since the area is now in private ownership with limited access and the project will not change the ownership, access will remain limited.

Comment 8. 4.3.2.1 Tangible Benefits for Hunting. This section assigns a monetary value of $7.98 per hunter-day. This value is based on a study of Pools 24, 25, and 26 and data gathered by the Fish and Wildlife Service in 1972 on actual amount spent by hunters. This dollar value was based on the assumption that the hunter make-up on Kaskaskia Island is similar to that on the pools. However, the correlation of hunter origin (resident vs. non-resident) which significantly influences out-of-pocket expense was not evaluated. Sections 2.3.11, 2.4.3, and 4.3.2 indicate that population growth of the island beyond the 1970 level is not anticipated during the 50-year planning focus and that current and expected future recreational use of the privately owned island resources is by island residents. Therefore, without further documentation on the out-of-pocket expenses incurred by local residents or an indication that data for pools 24, 25, and 26 were obtained predominantly from individuals residing within the immediate vicinity of the pools, the $7.98 hunter-day value should be replaced by the value range identified in Water Resources Council's Principles and Standards.

A similar correlation should be developed for the $6.30 per fisherman-day value identified in Section 4.3.2.2 Tangible Benefits for Fishing.

Response: Since this project was authorized on 23 October 1962 prior to 25 October 1973 it will not fall under the jurisdiction of the Water Resources Council Principles and Standards for Planning Water and Related Land Resources (Federal Register, 10 Sept 1973). Because of this fact, the Lower Mississippi River Valley Division has directed the St. Louis District to use Supplement No. 1 to Senate Document 97 which established a range of recreation unit values from $.50 to $1.50 per day. The value of $1.50 was used for the value of a fisherman day.

Comment 9: 6.0 Alternatives to the Proposed Action. The "no action" alternative was not discussed.

Response: The impacts of the "no action" alternative was summarized in Table 6-1. A discussion of this alternative has been added to the text.

d. Department of Transportation. Regional Representative of the Secretary. (16 March 1977)

Comment 1: The Draft Environmental Impact Statement for Flood Protection on the Mississippi River between Ste. Genevieve and St. Mary's, Missouri, has been reviewed and adequately considers the effect the project may have on areas within the jurisdiction of the Department of Transportation.

Response: Comment noted.

e. Department of Transportation. United States Coast Guard. (25 February 1977)

Comment 1: We have reviewed the draft environmental impact statement for Flood Protection on the Mississippi River between Sainte Genevieve and St. Marys, Missouri. We have no comment to offer on this document.

Response: Comment noted.

f. United States Environmental Protection Agency Region V (7 April 1977)

Comment 1: We have classified our comments as Category ER-2. Specifically, this means we have environmental reservations about the project because it will encourage development in the flood plain and we believe more information should be provided in the EIS to adequately assess the environmental impacts. This classification and the date of our comments will appear in the Federal Register.

Response: Comment noted.

Comment 2: According to the EIS, 233 people live on Kaskaskia Island which represents a continuing decline in the island's population from 1940 when the population was 640. If a flood of 1973's magnitude would occur again, it is expected that permanent evacuation of the island would occur. Conversely, if this project is implemented, the island population is expected to increase. By increasing flood protection, the project is increasing the attractiveness of the island to further development. Since the proposal will provide limited flood protection, the project will create a false sense of security to residents of the island. When the levee is eventually overtopped, flood losses are likely to be greater because of subsequent development. The EIS should discuss the increased damages resulting from increased development.

Response: The recommended plan for Kaskaskia Island represents a decision to aid in the preservation of the existing community on the island. This community while situated in an admittedly hostile environment possesses several important characteristics which were considered and weighed in making this decision. In addition to these considerations, a number of other factors may be pertinent to the concerns expressed in this comment. First, because of environmental factors only limited additional development on the island is anticipated. As outlined in the EIS, with the project an increase of approximately 57 persons could be expected over the project life. This population increase translates into an additional 18-25 dwelling units on the island. In addition while not claimed for benefit purposes, the freeboard of the design levee is at or near the 100 year flood frequency level. The levee is also designed so that in the event of a flood event which is higher than the levee, waters would overtop the levee on the downstream portion first and would back fill the interior.

These intervening factors further mitigate the adverse potential of flooding for the island. As the EIS notes in Section 4.3.1.7 however, these features cannot insure that damage-producing floods will not occur on Kaskaskia Island. Those individuals choosing to live on the island must be aware that their property cannot be made completely safe from flooding.

Comment 3: According to Executive Order 11296, Federal agencies have the responsibility to provide a broad and unified effort to prevent uneconomic uses and development in the Nation's flood plains. The EIS should discuss the compatability of this project with the intent of Executive Order 11296.

Response: As noted in comment 2 above, there are particular and unique aspects of Kaskaskia Island which were included in the evaluation of alternatives (see section 6.2.2 of the EIS). These factors have influenced the interpretation of EO 11296.

Comment 4: By raising levees, the project will further decrease the available flood plain which will cause flood stages to increase. Although it is indicated that the effects upon increased flood stages is negligible from raising the levees, the incremental effects of these levee projects have caused significant increases in flood stages. We refer to a paper prepared by Charles B. Belt, Jr. of St. Louis University, titled The 1973 Flood and the Effect of Man on the Stages of the Mississippi River Near St. Louis, Missouri which compares the gage height and discharge of flood crests on the Mississippi River at St. Louis, Missouri. On April 28, 1973 and June 20, 1908, the discharge of the Mississippi River at St. Louis was about 850,000 cfs, yet the stage was 8.28 feet less in 1908 than in 1973. Confinement of the floodway was identified as the cause. The EIS should provide a discussion of this problem including the approach that will be taken to avoid further confinement of the floodway.

Response: We believe these concerns in so far as they pertain to the present project are adequately addressed in sections 4.1.3 and 4.3.4 of the EIS.

g. Federal Power Commission (15 February 1977)

Comment 1: Our reviews concentrate basically on those areas of the electric power and natural gas industries for which the Federal Power Commission has jurisdiction by law, or where the staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in our areas of concern nor serious conflicts with Federal Power Commission responsibilities should this action be undertaken. Special attention was given to the section on non-structural alternatives. This appears to be a very desirable approach if justifiable.

Response: Comment noted.

h. State of Illinois. Executive Office of the Governor. Bureau of the Budget. Illinois Department of Conservation. (4 April 1977).

Comment 1: In general, the EIS does a good job of describing the project area and in discussing the impacts of the proposed work on the local environment. We are also pleased to see implementation of Section 150 of the Flood Control Act of 1976.

Response: Since the Draft Environmental Impact Statement was sent out for review, the decision has been made not to use Section 150. However, the wetlands will be created using project funds.

Comment 2: Sections 4.2.1., 4.2.2. and 4.3.2. Impact on Aquatic Communities, Impact on Terrestrial Communities, and Impact on Outdoor Recreation. These sections state that three of the borrow pits (157 acres) that are protected by the levee will remain for the entire 100-year life of the project. (This is good.) It is also mentioned that eight borrow pits (315 acres), unprotected by levees will, for the first 20 years after project completion, remain uncultivated and will furnish aquatic habitat and enhance the recreational activities of fishing and hunting for the local residents. (This, too, is good.)

Response: Comment noted.

Comment 3: The report also states that after 20 years, it is expected that the majority of the unprotected pits will be lost to siltation; therefore, agreements with the landowners will allow them to be cultivated in dry years. We would suggest that the final EIS should consider extending the period that these areas remain protected from cultivation. This would be done on the basis of a joint federal, state, local evaluation of each of these sites to ascertain the degree of siltation that has occurred; the site's habitat values; and the site's ability to be cultivated.

Response: The rationale behind allowing cultivation of the unprotected borrow pits after 20 years is that it will prevent establishment of woody vegetation, such as willows and cottonwoods. If such is allowed to establish itself, the pits will eventually develop into bottomland forest habitat, a habitat type fairly abundant on the unprotected flood plain of the Mississippi River. After 20 years these areas will probably still remain too wet to cultivate except during dry years. Such periodic cultivation will eliminate woody vegetation and hopefully allow marsh habitat, a more unique type of habitat along this section of the Mississippi River, to remain during wet or normal years.

Comment 4: Sections 4.3.2.1. and 4.3.2.2. Tangible Benefits for Hunting and Fishing. Figures used in these sections to calculate hunting and fishing benefits are derived from the Department of the Interior, Fish and Wildlife Service 1972 publication, National Survey of Hunting and Fishing 1970. The 1975 Survey will soon be available and should be used in the final EIS.

Response: Since the project was authorized on 23 October 1962 prior to 25 October 1973, it does not fall under the jurisdiction of the Water Resources Council Related Land Resources Principles and Standards (Federal Register, 10 September 1973). Because of this fact, Supplement No. 1 to Senate Document 97, which established a range of recreation unit values from $.50 to $1.50 per day, was used. The value of $1.50 was used for the value of a fisherman-day.

Comment 5: Section 4.2.1. Impact on Aquatic Communities. This section indicates ten borrow pits riverward of the levee will be used to furnish material for construction of the new levee and that these pits will be on cultivated land. Therefore, little wildlife or woodland habitat would be lost. (This is good.)

Response: Comment noted.

Comment 6: In construction of the new levee, has the St. Louis District considered the possible use of dredged material obtained from channel maintenance activities as an additional source of borrow material? One such area is that portion of the levee along the Mississippi River between Miles 115 and 112 on the east side of Kaskaskia Island. We noted that channel maintenance dredging has been performed at least two times during the past dredging season immediately upstream from Kaskaskia Island. This area appears to be a "problem area" and will probably need to be redredged in the future. If it were possible to "use" this spoil material during the Kaskaskia Island levee construction, it could prove beneficial to both state and federal interests.

Response: Yes, this source was considered, but the cost of moving the dredged material the necessary distance to the construction site was prohibitive.

i. State of Illinois. Executive Officer of the Governor. Bureau of the Budget. Illinois Department of Transportation. (13 May 1977)

Comment 1: The project does not represent an optimum levee height, largely because of sociological constraints.

Response: Comment noted.

Comment 2: The National Economic Development plan is a relocation of floodable structures in conjunction with fish and wildlife and other land management. Such nonstructural measures have been zealously urged by Illinois, other states, the Congress, and parts of the Corps hierarchy. The St. Louis District reports that dehabitation is not acceptable to the local sponsor. Note the NED plan has no non-Federal costs.

Response: After economic reanalysis the NED plan has been changed to a 4-foot landside levee raise and increased the size of gravity drains.

Comment 3: The project is not economically feasible at the current discount rate (6 3/8 percent). The grandfathered discount rate (3 1/4 percent) has been approved by Congress and accepted by the President in this particular case.

Response: Comment noted.

Comment 4: The sixfold cost increase since authorization is the result of inflation and reformulation, both of which are necessary to project financial feasibility.

Response: Comment noted.

Comment 5: No future urban development is projected for "with project" or "without project" conditions. This is consistent with state and Federal policy on structures in flood prone areas.

Comment 6: The project will induce damages at St. Mary's ($3,000 per year) and Ste. Genevieve ($7,000 per year). These values are correctly discounted from project benefits. However, the plan contains no mechanism for compensating the damaged parties at those two places and therefore is incomplete.

Response: We believe that it is inaccurate to indicate that the report is deficient because it fails to cite a mechanism whereby the parties would be compensated for a slight increase in damage susceptibility from an infrequent flood event. To the best of our knowledge, there is no established procedure for compensating individuals for losses in a case such as this. In the absence of specific legislation to cover this situation, we believe that the report is complete with the documentation of the impact.

j. Illinois Archaeological Survey (18 February 1977)

Comment 1: A review of both documents indicates that your office has carefully considered the impact upon the existing archaeological resources, and an excellent survey and inventory has been undertaken for the Kaskaskia Island area. This work is indicated on pages 47 and 63 of the EIS and pages 40-41 and 74 of the General Design Memorandum - Phase 1. The Final EIS should outline in general plans for mitigation of the impact of the project upon these archaeological resources.

Response: Comment noted.

k. Illinois Natural History Survey (28 February 1977)

Comment 1: The Survey has no comment to offer other than though we recognize the improvement in wildlife habitat likely to obtain from construction of the borrow pits, we regret the destruction of agricultural crop land for this purpose.

Response: Comment noted.

1. Southern Illinois University at Carbondale. Department of Geography. A.D. Horsley, Assistant Professor. (4 March 1977)

Comment 1: As I understand from recent reports, the gravity drain project is no longer included in the project. Thus I have not included any of my original concerns per that expenditure.

Response: The interior drainage project has been abandoned because of inadequate economic justification, but the existing gravity drains will be enlarged when the levee is raised.

Comment 2: In general, the Environmental Input (sic) Statement is very well done with complete and apparently accurate documentation. I am particularly pleased with the attention the U.S. Army Corps of Engineers has given to the examination of the "impact of the project" on the local environment.

Response: Comment noted.

Comment 3: I found one typographical mistake on page 9 on the date of the first flood. Should it read "1844"?

Response: This has been corrected.

Comment 4: Would on page 4, the Age-Sex Pyramid be more functional and visually useful if actual number of population were listed among with the percentages in each age group.

Response: The age pyramid has been modified to show actual numbers of individuals occupying each cohort. As noted on p. 56 of App. 5 in the General Design Memorandum, the age structure is taken on the basis of age data on 180 residents. As outlined in the GDM, the initial population count performed by the St. Louis District in May 1976 placed the total number of permanent residents at 195. Age data were not available for 15 residents. Meetings with the Kaskaskia Island Citizen's Committee (KICC) in June 1976 revealed that an additional 14 residents had returned to the island in June 1976. In addition, the KICC performed an informal count which placed the total number of permanent residents at 233. This population figure has been used in this report. As noted in the GDM subsequent demographic data are based on the initial population count.

Comment 5: Section 2.35 page 42-45 seems to be a viable argument but there is no supporting evidence given. The "community esperit de corps" can be documented and quantified just as soils or other physical data are.

Response: Most social scientists would argue that the characteristics which are considered under the heading of community cohesion differ qualitatively from physical data such as soils and other natural phenomena. As such different methods of study from those used to study natural phenomena may be appropriate - or at least certain precautions should be taken in using methods similar to natural science procedures in order to deal with these data effectively. In the present case the study of community cohesion was approached from what is termed in social science a versteken approach. This approach emphasizes the subjective interpretation and synthesis of information on the part of the researcher. The commentor's attention is invited to a discussion of the method in T. Abel, "The Operation Called Versteken", American Journal of Sociology, Vol. 54, pp. 211-218, 1948.

It should be noted that other more empirically-grounded techniques such as standardized surveys are available to study community cohesion. Time and institutional constraints, however, prevented their employment and necessitated the use of more subjective, but, it is felt equally appropriate research strategy.

Comment 6: Page 49, Section 2.43 is a beginning to a potentially strong argument for the project; but the statement leaves this analyst with incomplete evidence to such positions as "growth...is not anticipated etc." This could be strengthened by using the information on page 51 about "insurance rates" impact on future growth. However, on page 57, Section 4.3.1.1 you comment that some residents may return once the project is finished. Are these points compatible?

Response: The points are compatible, although perhaps not in a straightforward manner. Section 2.4.3 points out that there are factors which should exert positive influence on population maintenance, and limited growth, on the island - viz relatively large numbers of younger age groups on the island, nearby employment opportunities, strong community attachment of residents and former residents. At the same time, however, there are constraints which will probably limit population growth. In this regard, Section 2.4.3 has been supplemented to note that flood insurance regulations are likely to constitute an additional constraint to some who may wish to build on the island. Despite constraints and sacrifices living on the island may entail, it is projected that, with protection, some additional population growth on the island is likely. In part this population growth is likely to come from former residents who have indicated a desire to relocate on the island if additional protection is provided.

Comment 7: The statement on flood insurance seems quite unrelated to the project at hand. Should you tie together the insurance regulations at all with the project? It appears that the insurance program would be undertaken as planned with or without the "levee raising project".

Response: The flood insurance program will be undertaken with or without the levee raise project. Information on the program is included in this statement because it is likely to exert some influence on the character of future development on the island.

Comment 8: Once the levee is raised, will there be "riprap" or some other covering used to decrease slumping of the levee due to the regular rains in the area?

Response: No riprap will be used on the new levee. It will, however, be seeded with grass to decrease erosion. There is some riprap on the northern portion of the existing levee but this will be removed.

Comment 9: Will the borrow pits cause any draw down of interface soil moisture at a greater rate in those farm lands near the pits?

Response: It is possible that this could happen, but we are aware of no such significant problems in the over thirty years of levee construction between Alton and Gale.

Comment 10: Statements suggest that population might grow due to levee height increase; but will that occur since levee protection could raise the property and farmstead values to a level that would encourage the selling of land by small farms and an extension of large farmer's holdings in turn.

Response: Economic analysis suggests that little increase in land values on the island will occur as a result of increased protection. Given this finding, there is little reason to expect that large farms should be encouraged to buy out small ones.

m. Wagner, Bertrand, Bauman & Schmieder, Attorneys at Law (9 February 1977)

Comment 1: I have reviewed both proposals in detail and at the outset wish to compliment you and your division upon the apparent excellent job of securing factual background data and information and the compilation of statistical and historical data.

Response: Comment noted.

Comment 2: As you may know, I have been involved in the attempted rebuilding project of Kaskaskia Island as its attorney since 1973 and I am certainly gratified that it now appears that this project will be implemented in the very near future.

Response: Comment noted.

Comment 3: A review of the Environmental Statement would appear to be acceptable on its face.

Response: Comment noted.

Comment 4: The reclamation of over 9000 acres of rich agricultural land and the preservation of the historical site certainly should have a beneficial environmental impact not only upon the residents of Kaskaskia but on all of the Mississippi Valley area within hundreds of miles.

Response: Comment noted.

Comment 5: Be assured that I am wholeheartedly in concert with your recommendations of the selected plan, that is, to increase flood protection from ten years to approximate 50 years frequency which as your report notes, would cause no detrimental effect on either the natural environment or projected natural environment.

Response: Comment noted.

Comment 6: With respect to the proposals for the general design for flood protection Phase I would also appear to be the appropriate authorized plan. To raise the levee eight feet and the crown width increased from ten feet to twenty feet certainly would increase the protection to the land and to the residents and hopefully obviate the possibility of a repeat of the devastating flood of 1973.

Response: Comment noted.

Comment 7: We note that the cost to benefit ratio is one-to-one for the proposed Phase I plan and consequently, there should be no objections to the product on the basis of economic benefit.

Response: Comment noted.

Comment 8: By contrast, the alternative plans of purchasing the island for either a lease back for partial agricultural use, or to devote the entire area to a reversion to a natural state would neither appear to be feasible nor in the best interest of the State of Illinois, the Mississippi Riverway in general and more particularly would be cruel and inhuman to the residents and owners of land on Kaskaskia Island.

Response: Comment noted.

Comment 9: We strenuously oppose the alternative plans and hope that your Department will assist in the summary dismissal of the alternative plans from serious consideration.

Response: Comment noted.

Comment 10: I will make every effort to attend a public meeting which you are scheduling but in the event that I am unable to attend, I would appreciate your considering this communication as my strong support for your Phase I recommendations as stated and urge that the plans be implemented with the greatest possible speed. Again, I congratulate you and your staff on making a final, effective, decisive and fair decision in recommending the raising of the levee and the broadening of same to prevent a repetition of the flood disaster of 1973.

Response: Comment noted.

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Appendix A. Benefit-cost summary (Economic data were extracted from the U. S. Army Corps of Engineers GDM-Phase I, Flood Protection on the Mississippi River Between Sainte Genevieve and Saint Mary's, Missouri)

(ANALYSIS WITH 3⅛ PERCENT INTEREST RATE)
100 YEAR ANALYSIS

FEDERAL COSTS	
Construction Subtotal	$ 7,656,000
Contingencies	1,914,000
Total for Levee and Appurtenances	9,570,000
Engineering and Design	1,215,000
Supervision and Administration	621,000
Total Federal First Costs	$11,406,000
NON-FEDERAL COSTS	
Lands and Damages	$ 718,000
Relocations	138,000
Total Non-Federal First Costs	856,000
TOTAL FEDERAL AND NON-FEDERAL FIRST COSTS	$12,262,000
INCREASED OPERATING COST (ANNUAL)	4,000
ANNUAL CHARGES	412,000
BENEFITS	
Crop Damage Prevented	$ 104,000
Gravity Drainage Improvements	62,000
PL 99 Reduction	170,000
Property Damage Reduction	121,000
Increased Returns	3,000
Fish and Wildlife Benefits	5,000
Project Induced Damages (-)	-10,000
TOTAL ANNUAL BENEFITS	455,000
BENEFIT COST RATIO	1.09

APPENDIX B

LETTERS FROM ILLINOIS STATE HISTORIC
PRESERVATION OFFICER AND THE NATIONAL PARK SERVICE
INTERAGENCY ARCHEOLOGICAL SERVICES

APPENDIX B

STATE OF ILLINOIS

DEPARTMENT OF CONSERVATION

605 STATE OFFICE BUILDING
400 SOUTH SPRING ST.
SPRINGFIELD 62706

CHICAGO OFFICE ROOM 100, 160 N. LA SALLE ST., 60601

ANTHONY T. DEAN
DIRECTOR

WILLIAM A. WATTS
ASSISTANT DIRECTOR

June 24, 1976

Mr. Jack F. Rasmussen
Chief, Planning Branch
Engineering Division
St. Louis District, CORPS
210 N. 12th Street
St. Louis Missouri 6[illegible]

Dear Mr. Rasmussen:

My staff archaeologist has reviewed the report "Survey of Archaeological Resources along the existing and proposed levees on Kaskaskia Island in Randolph County and Ste. Genevieve, Missouri." In reference to this and to your letter of May 19, 1976, it appears that the study thus far has been adequately done.

Since [illegible] sites within the possible area of construction are on the National Register, it will be necessary to coordinate with this office to develop appropriate mitigation plans.

Sincerely,

Anthony T. Dean
State Historic Preservation Officer

ATD/LDA
cc: T. D. Bornbacker

David Kenney
DIRECTOR

Illinois Department of Conservation

ASSISTANT DIRECTOR

605 STATE OFFICE BUILDING • 400 SOUTH SPRING STREET • SPRINGFIELD 62706
CHICAGO OFFICE – ROOM 100, 160 NO. LASALLE 60601

May 6, 1977

Mr. Jack R. Niemi
Department of the Army
St. Louis Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

The report "Survey of the Archaeological Resources along the Existing and Proposed Levees on Kaskaskia Island in Randolph County, Illinois and Ste. Genevieve County, Missouri" is satisfactory and meets the requirements for an adequate reconnaissance survey.

We will expect to hear further from you concerning the National Register eligibility of the sites to be affected by the levee raise and on the impact on the French Colonial District.

Sincerely,

David Kenney
State Historic Preservation Officer

DK/LSA

United States Department of the Interior

NATIONAL PARK SERVICE
SOUTHEAST REGIONAL OFFICE
1895 Phoenix Boulevard
Atlanta, Georgia 30349

IN REPLY REFER TO:

MAY 17 1977

Mr. Jack R. Niemi
Chief, Engineering Division
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

We have reviewed the report Survey of the Archaeological Resources Along the Existing and Proposed Levees on Kaskaskia Island in Randolph County, Illinois, and Ste. Genevieve County, Missouri by Jean Rita Linder. Although the reviewer noted certain deficiencies and items that might be changed, the report seems adequate in view of the project modification. A copy of the reviewer's comments is enclosed for your consideration.

The opportunity to review this report is appreciated.

Sincerely yours,

Wilfred M. Husted

Wilfred M. Husted
Acting Chief, Interagency
Archeological Services-Atlanta

Enclosure

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

JULY 1973 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Chief, Interagency Archeological Services-Atlanta DATE: May 12, 1977

FROM : Intern, Interagency Archeological Services-Atlanta

SUBJECT: Review of Survey of the Archeological Resources Along the Existing and Proposed Levees on Kaskaskia Island in Randolph County Illinois, and Ste. Genevieve County, Missouri by Jean Rita Linder

This report represents the results of a pedestrian survey conducted in connection with a proposed levee-construction project on Kaskaskia Island, Randolph County, Illinois, and Ste. Genevieve County, Missouri. The prehistoric record of the area is incomplete, since there have been few excavations. The data, therefore, is rather scarce; in fact the only data available regarding Kaskaskia Island, is from the survey - and is not very illuminating.

The limited discussion and interpretation of the Archaic period, as known in the area, is understandable, given the above-mentioned dearth of local archeological data. However, more extrapolative data could be presented concerning the Modoc Rockshelter, which is discussed in terms of its relation to an Archaic occupation within the project area. Given the fact that the Modoc Rockshelter was rather extensively investigated, as well as the fact that it is located not far from the Archaic occupation described within the report (11-R-342) - more attention should have been paid to the associated data than was evidenced in the report's brief mention of it.

The investigation of historic occupation of the area is handled with the statement "although it is outside the scope of this project...". This statement seems to represent a general misinterpretation of the scope of the survey; a survey of this nature should identify, document, and evaluate the cultural resources within the project area - not only the prehistoric remains, but the historic structures and remains as well.

The descriptions of each site are adequate, however more information would be helpful. The mention on p. 10 of "one water worn (or heat treated?) modified flake", associated with a particular site description, is rather confusing. Water and heat have quite different effects on a flake of chert - it is hoped that the author realizes this. This needs to be clarified.

The map provided with the report is too big to be of any use. A similar map should be scaled down to an appropriate size to be included in the report - since the information contained in the present map is sufficient, but its size makes it too awkward to use with the report.

In light of the fact that the letter accompanying the report explains a change in the Corps of Engineers' plans regarding this construction project, I would say that the report is adequate and should be accepted. However, the main reason for this is because, due to the change in plans the project, now, only includes a levee raise - not new or proposed levees; therefore the limited nature of this report can be accepted as adequate since there will be only limited construction work in the area.

Intern

APPENDIX C

LETTERS OF COORDINATION

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Eastern Region
633 West Wisconsin Avenue
Milwaukee, WI 53203

8420
April 1, 1977

District Engineer
Corps of Engineers
North Central District Office
219 South Dearborn Street
Chicago, IL 60604

Dear Sir:

We have reviewed the environmental statement for Kaskaskia Island Drainage and Levee District in Randolph County, Illinois, and have the following comments.

1. Page 25 shows a benefit/cost ratio of .59. If a favorable ratio is required at today's interest rate, it is difficult for us to see how the project could be endorsed. The use of excessively low interest rates serve no useful purpose in determining the economics of a project.

2. It appears that the long term interests of the island residents and the general problems may best be served by selecting one of the nonstructural alternatives. Such alternatives should be looked at fully.

Thank you for the opportunity to review these documents. We will look forward to reviewing the final.

Sincerely,

for STEVE YURICH
Regional Forester

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
P.O. Box 678, Champaign, Illinois 61820

March 21, 1977

Mr. Jack R. Niemi
Chief, Engineering Division (LMSED-BP)
U. S. Army Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

We have reviewed the draft environmental impact statement for the Kaskaskia Island Drainage and Levee District located in Randolph County, Illinois.

Our Soil Scientists suggest changes in attached revised Table 2-1, Soil Classification Conversion Chart, page 8. These changes reflect updated information. If you have questions concerning these changes please contact Mr. Earl Voss, State Soil Scientist, USDA, Soil Conservation Service, P.O. Box 678, Champaign, Illinois 61820, telephone 217-356-3785.

We believe consideration should be given to changing Table 4-1 which indicates that the rare wood frog (Rana sylvatica) will be benefited by the borrow pits and the wildlife plantings around borrow pits. This seems unlikely since the wood frog is restricted to mesic forests in which there are permanent or semipermanent pools. The borrow pits and their associated wildlife plantings do not furnish this type of habitat. Also, sistrurus catenatus catenatus, listed in Table 2-7 as rare in Missouri, and Crotalus horridus horridus, listed as vulnerable in Illinois, are included in the section on pestiferous plants and animals. This seems contradictory. A discussion of vectors would seem appropriate in the environmental impact statement but the categorization of certain organisms as pests does not. The striped skunk listed in this section could just as well be considered beneficial because its diet includes rodents and insects. Likewise, snakes of the genus Natrix, while aggressive, are not dangerous and should not be classified as pests.

We appreciate the opportunity to review this draft environmental impact statement. The area conservationist for the Soil Conservation Service serving Randolph County is Farrell E. Croy, Area Conservationist, Soil Conservation Service, 828G East Main Street, P. O. Box 2767, Carbondale, Illinois 62901, telephone 618-549-5329. He will be the SCS representative at public meetings, etc.

Sincerely,

Robert L Eddleman
for Daniel E. Holmes
State Conservationist

Attachment

United States Department of the Interior

OFFICE OF THE SECRETARY
NORTH CENTRAL REGION
2510 DEMPSTER STREET
DES PLAINES, ILLINOIS 60016

ER 77/127

April 14, 1977

Colonel Leon E. McKinney
District Engineer
U.S. Army Engineer District,
St. Louis
210 North 12th Street
St. Louis, Missouri 63101

Dear Colonel McKinney:

The Department of the Interior has reviewed the draft environmental impact statement (EIS) and the Phase I General Design Memorandum (GDM) for Flood Protection on the Mississippi River between Sainte Genevieve and Saint Marys, St. Genevieve and Perry Counties, Missouri and Randolph County, Illinois, as requested in your transmittal letter of February 1, 1977.

We should state at the outset that the proposed raising of the levees at Kaskaskia Island is, in itself, not a complex proposal, nor one with which we are inclined to take great exception. Our later specific comments on the EIS and GDM are not extraordinary in any way. However, the Department of the Interior must question the manner in which the Corps of Engineers has classified certain alternative plans for the project. The selected plan--a structural proposal to raise the levees 8 feet and enlarge existing gravity drains to improve interior drainage--is termed an Environmental Quality (EQ) plan. The National Economic Development (NED) Plan would consist of purchasing the entire island for development and management as a wildlife area. This reversal of terminology appears to be a misinterpretation of the intent of the Water Resources Council's Principles and Standards for Planning Water and Related Land Resources (Federal Register, 9/10/73).

Section II D of the Standards states that "The national economic development objective is enhanced by increasing the value of the nation's output of goods and services and improving national economic efficiency", and that "Components of the national

economic development objective include: (a) The value of increased outputs of goods and services resulting from a plan...". This section goes on to enumerate increases in crop yields as an example of direct increases in the nation's output and the reduced disruption of economic activity due to floods as an example of "direct increases in productivity from water and land development that contribute to national output". The same section addresses the "EQ" objective: "The environmental objective is enhanced by management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems in the area under study and elsewhere in the Nation. This objective reflects society's concern and emphasis for the natural environment and its maintenance and enhancement as a source of present enjoyment and a heritage for future generations." Components of the environmental objective are then listed as including "Management, protection, enhancement or creation of areas of natural beauty and human enjoyment..."; Management, preservation, or enhancement of especially valuable or outstanding... biological (including fish and wildlife)...resources and ecological systems"; and "Avoiding irreversible commitments of resources to future uses...". Section V B of the Standards, titled "Plan Formulation - Specification of Components", further defines specific components of the NED and EQ objectives. These and other parts of the Principles and Standards do not appear to conform with the classification or nomenclature you have adopted for your selected plan and NED plan.

Our concern is more with the precedent that may be set than with the specifics of the Kaskaskia Island project. We, therefore, request an expanded discussion of the rationale used to classify the alternatives.

DRAFT PHASE I GDM

PROJECT PLAN

Description (Pages 43-44)

The bottom elevations of the new larger gravity drains discussed should not be lower than the existing drains.

Measures should be included to extend the life of the borrow areas not within St. Genevieve Levee District No. 2 to a 50-year period.

Terms of acquisition for the right-of-way not within St. Genevieve Levee District No. 2 should be changed to prohibit cultivation of borrow areas for a period of 50 years (not 20) from the completion of project construction.

Recreation Resources (Page 63)

Page 63 of the GDM indicates that a discussion of recreation resources of the project area is not applicable. Even though recreation is not identified as a project purpose, a discussion of recreation opportunities and needs within the project area is necessary before an evaluation of impacts on these opportunities and related project costs (in terms of opportunities foregone) can be assessed. To alleviate this deficiency, the GDM should incorporate the following information:

1. Existing recreational use of the study area.
2. Recreational needs of the study area.
3. Adequacy of lands, access, and facilities within the project area to meet existing and projected needs in surrounding areas.
4. Measures to minimize adverse impacts on the recreational opportunities of the study area resulting from project implementation.
5. Project related actions to increase recreational opportunities in the study area through the addition of river access points and trail facilities.

Due to the scope of the proposed project and nature of the study area, most recreation activities would be extensive in nature. In 1974 the Illinois Department of Conservation indicated that in Region 4 (area of the proposed project) hiking/walking, fishing, and hunting were rated as the third, fifth, and sixth priority activities in terms of needs. It is suggested that consideration be given to ensuring access to the river from Kaskaskia Island for preserving current hunting and fishing opportunities. It is also suggested that the levee improvement be developed to accommodate walking activities for current or future use.

DRAFT ENVIRONMENTAL STATEMENT

The draft statement should be expanded to identify impacts on existing and potential recreation opportunities in the study area

1.3 Project Features

The project plan includes the replacement of existing gravity drains with larger drains. Will the replacement drains be installed at the same bottom elevations as the existing drains?

2.3.10 National Register Resources

We note on page 47 that nine archeological sites located within the French Colonial Historic District, an entry on the National Register of Historic Places, may be affected by the proposed action and that appropriate consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation is being conducted in accordance with the procedures set forth in 36 CFR Part 800.

Adherence to these procedures and implementation of official recommendations received will satisfy associated environmental and jurisdictional concerns of the U.S. Department of the Interior.

2.3.11 Outdoor Recreation

This section indicates that Kaskaskia Island has no publicly owned parkland and that privately owned swampy areas, sloughs, and bottomland forests are used heavily for hunting and fishing by island residents. It is assumed that access to these lands is via privately owned lands. Access, if any, to river resources (boat launching) for fishing and hunting by residents and non-residents should be discussed.

4.2.3 Impact on Rare and Endangered Species

Table 4-1 is an especially useful method of impact evaluation for rare and/or endangered species.

4.3.2 Impact on Outdoor Recreation

This section indicates that wildlife plantings and certain borrow pits resulting from the project will enhance recreational opportunities. However, this section does not indicate whether any adverse impacts to recreation will result from the project. This section should discuss potential adverse impacts on recreation resulting from project implementation such as restricting river access and access to swamps, sloughs, and bottomland forests.

4.3.2.1 Tangible Benefits for Hunting

This section assigns a monetary value of $7.98 per hunter-day. This value is based on a study of Pools 24, 25, and 26 and data gathered by the Fish and Wildlife Service in 1972 on actual amount spent by hunters. This dollar value was based on the assumption that the hunter make-up on Kaskaskia Island is similar to that on the pools. However, the correlation of hunter origin (resident vs. non-resident) which significantly influences out-of-pocket expense was not evaluated. Sections 2.3.11, 2.4.3, and 4.3.2 indicate that population growth of the island beyond the 1970 level is not anticipated during the 50-year planning focus and that current and expected future recreational use of the privately owned island resources is by island residents. Therefore, without further documentation on the out-of-pocket expenses incurred by local residents or an indication that data for pools 24, 25, and 26 were obtained predominantly from individuals residing within the immediate vicinity of the pools, the $7.98 hunter-day value should be replaced by the value range identified in Water Resources Council's Principles and Standards.

A similar correlation should be developed for the $6.30 per fisherman-day value identified in Section 4.3.2.2 Tangible Benefits for Fishing.

6.0 Alternatives to the Proposed Action

The "no action" alternative was not discussed.

Sincerely yours,

David L. Jervis

David L. Jervis
Regional Environmental Review Officer

DEPARTMENT OF TRANSPORTATION
REGIONAL REPRESENTATIVE OF THE SECRETARY
ROOM 634, FEDERAL BUILDING
601 EAST 12th STREET
KANSAS CITY, MISSOURI

REGION VII

March 16, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
Corps of Engineers - St. Louis District
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

The Draft Environmental Impact Statement for Flood Protection on the Mississippi River between Ste. Genevieve and St. Mary's, Missouri, has been reviewed and adequately considers the effect the project may have on areas within the jurisdiction of the Department of Transportation.

Thank you for the opportunity to review this draft.

Sincerely,

R. R. Waesche, RADM USCG (Ret.)
Secretarial Representative

cc:
RADM W. E. Caldwell, USCG
Mr. John B. Kemp, FHWA
Mr. Herrell R. Bird - FRA

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
COMMANDER (dpl/eis)
SECOND COAST GUARD DISTRICT
FEDERAL BLDG
1520 MARKET ST
ST LOUIS MO 63103

16475
Ser 020
25 February 1977

Department of the Army
St. Louis District, Corps of Engineers
Attn: LMSED-BP
210 North 12th Street
St. Louis, MO 63101

Gentlemen:

We have reviewed the draft environmental impact statement for Flood Protection on the Mississippi River between Sainte Genevieve and Saint Marys, Missouri. We have no comment to offer on this document.

Thank you for the opportunity to review this environmental impact statement.

Sincerely,

C. E. Johnson, Jr.

C. E. JOHNSON, JR.
Environmental Protection Specialist
By direction of the District Commander

Copy to:
COMDT (G-WEP-7)
DOT SECREP Region VII
DOT (tes), Office of Environmental Affairs
CEQ (5)

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION V
230 SOUTH DEARBORN ST.
CHICAGO, ILLINOIS 60604

1977

Mr. Jack R. Niemi
Department of the Army
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

RE: 77-018-181
D-COE-F36048-IL

Dear Mr. Niemi:

In response to your letter dated February 1, 1977, we have reviewed the Draft Environmental Impact Statement (EIS) for Flood Protection on the Mississippi River between Sainte Genevieve and St. Mary's, Missouri. The plan consists of raising the levee approximately 8 feet which will provide protection from a flood with the probability of occurrence of approximately once in 50 years. We have classified our comments as Category ER-2. Specifically, this means we have environmental reservations about the project because it will encourage development in the flood plain and we believe more information should be provided in the EIS to adequately assess the environmental impacts. This classification and the date of our comments will appear in the Federal Register.

According to the EIS, 233 people live on Kaskaskia Island which represents a continuing decline in the island's population from 1940 when the population was 640. If a flood of 1973's magnitude would occur again, it is expected that permanent evacuation of the island would occur. Conversely, if this project is implemented, the island population is expected to increase. By increasing flood protection, the project is increasing the attractiveness of the island to further development. Since the proposal will provide limited flood protection, the project will create a false sense of security to residents of the island. When the levee is eventually overtopped, flood losses are likely to be greater because of subsequent development. The EIS should discuss the increased damages resulting from increased development.

According to Executive Order 11296, Federal agencies have the responsibility to provide a broad and unified effort to prevent uneconomic uses and development in the Nation's flood plains. The EIS should discuss the compatability of this project with the intent of Executive Order 11296.

By raising the levees, the project will further decrease the available flood plain which will cause flood stages to increase. Although it is

indicated that the effects upon increased flood stages is negligible from raising the levees, the incremental effects of these levee projects have caused significant increases in flood stages. We refer to a paper prepared by Charles B. Belt, Jr. of St. Louis University, titled The 1973 Flood and the Effect of Man on the Stages of the Mississippi River Near St. Louis, Missouri which compares the gage height and discharge of flood crests on the Mississippi River at St. Louis, Missouri. On April 28, 1973 and June 20, 1908, the discharge of the Mississippi River at St. Louis was 850,000 cfs, yet the stage was 8.28 feet less in 1908 than in 1973. Confinement of the floodway was identified as the cause. The EIS should provide a discussion of this problem including the approach that will be taken to avoid further confinement of the floodway.

Thank you for providing us with this opportunity to comment on this Draft EIS. Please provide us with two copies of the Final EIS at the same time it is filed with the Council on Environmental Quality.

Sincerely yours,

Ronald L. Mustard

Ronald L. Mustard
Acting Chief
Environmental Review Section

WASHINGTON, D.C. 20426

February 15, 1977

U. S. Department of the Army
St. Louis District, Corps of
Engineers
210 North 12th Street
St. Louis, Missouri 63101

ATTN: LMSED-BP

Dear Sir:

I am replying to your request for comments on the Draft Environmental Impact Statement for the Kaskaskia Island Drainage and Levee District.

Our reviews concentrate basically on those areas of the electric power and natural gas industries for which the Federal Power Commission has jurisdiction by law, or where the staff has special expertise in evaluating environmental impacts involved with the proposed action. It does not appear that there would be any significant impacts in our areas of concern nor serious conflicts with Federal Power Commission responsibilities should this action be undertaken. Special attention was given to the section on non-structural alternatives. This appears to be a very desirable approach if justifiable.

Thank you for the opportunity to review this statement.

Sincerely,

Jack M. Heinemann
Advisor on Environmental
Quality

STATE OF ILLINOIS
EXECUTIVE OFFICE OF THE GOVERNOR
BUREAU OF THE BUDGET
SPRINGFIELD 62706

April 4, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
Department of the Army
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

RE: Draft Environmental Statement - Flood Protection on the Mississippi River Between Sainte Genevieve and Saint Marys, Missouri
DEIS #77-02-031

Dear Mr. Niemi:

Pursuant to the National Environmental Policy Act (NEPA) and the established rules and procedures for its implementation and in accordance with OMB Circular A-95 (revised) and the administrative policy of the State, the Illinois State Clearinghouse is transmitting the attached comments on the referenced project. Representatives of all State agencies whose activities might be affected by the proposed project have been provided an opportunity to review this subject.

Subject to the inclusion and discussion of the attached comments in the final Statement, the project was found not to be in conflict with the plans, policies, or priorities of any cognizant State agency.

It is requested that a copy of the final Statement be sent to the State Clearinghouse and to the commenting agency.

Thank you for your cooperation in this matter.

Respectfully,

T. E. Hornbacker, Director
Illinois State Clearinghouse

TEH:mc
Attachment
cc: Richard Lutz, IL Department of Conservation

STATE OF ILLINOIS

DEPARTMENT OF CONSERVATION

605 STATE OFFICE BUILDING
400 SOUTH SPRING ST.
SPRINGFIELD 62706

David Kenney
DIRECTOR

CHICAGO OFFICE—ROOM 100, 160 N. LA SALLE ST., 60601

April 1, 1977

Mr. Terry Hornbacker
State Clearinghouse
524 So. 3nd, 3rd Floor
Springfield, IL 62706

Re: DEIS #77-02-031
Kaskaskia Island Levee Raise

Dear Mr. Hornbacker:

The Department of Conservation has reviewed the DEIS for Flood Protection on the Mississippi River between Sainte Genevieve and Saint Marys, Missouri. In general, the EIS does a good job of describing the project area and in discussing the impacts of the proposed work on the local environment. We are also pleased to see implementation of Section 150 of the Flood Control Act of 1976.

Our specific comments on the DEIS follow:

1. Sections 4.2.1., 4.2.2. and 4.3.2. Impact on Aquatic Communities, Impact on Terrestrial Communities, and Impact on Outdoor Recreation.

These sections state that three of the borrow pits (157 acres) that are protected by the levee will remain for the entire 100 year life of the project. (This is good). It is also mentioned that 8 borrow pits (315 acres), unprotected by levees, will, for the first 20 years after project completion, remain uncultivated and will furnish aquatic habitat and enhance the recreational activities of fishing and hunting for the local residents. (This too, is good).

The report also states that after 20 years it is expected that the majority of the unprotected pits will be lost to siltation, therefore, agreements with the landowners will allow them to be cultivated in dry years. We would suggest that the final EIS should consider extending the period that these areas remain protected from cultivation. This would be done on the basis of a joint federal, state, local evaluation of each of these sites to ascertain the degree of siltation that has occurred; the site's habitat values; and the sites ability to be cultivated.

2. Sections 4.3.2.1. and 4.3.2.2. Tangible Benefits for Hunting & Fishing

Figures used in these sections to calculate hunting and fishing benefits are derived from the Department of the Interior, Fish and Wildlife Service 1972 publication, National Survey of Hunting and Fishing 1970. The 1975 Survey will soon be available and should be used in the final EIS.

3. Section 4.2.1. Impact on Aquatic Communities

This section indicates 10 borrow pits riverward of the levee will be used to furnish material for construction of the new levee and that these pits will be on cultivated land. Therefore, little wildlife or woodland habitat would be lost. (This is good.)

In construction of the new levee has the St. Louis district considered the possible use of dredged material obtained from channel maintenance activities as an additional source of borrow material? One such area is that portion of the levee along the Mississippi River between miles 115 and 112 on the east side of Kaskaskia Island. We note that channel maintenance dredging has been performed at least 2 times during the past dredging season immediately upstream from Kaskaskia Island. This area appears to be a "problem area" and will probably need to be redredged in the future. If it were possible to "use" this spoil material during the Kaskaskia Island levee construction it could prove beneficial to both state and federal interests.

We appreciate this opportunity to comment and hope you will find these comments helpful in preparing the State comments on the DEIS. Our comments on the Phase I GDM will be sent directly to the Corps as they involve a continuing planning effort between Corps and Department of Conservation staff.

Sincerely,

Richard W. Lutz, Head
Impact Analysis Section
Division of Long Range Planning

RWL:mjk

STATE OF ILLINOIS
EXECUTIVE OFFICE OF THE GOVERNOR
BUREAU OF THE BUDGET
SPRINGFIELD 62706

May 20, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
Department of the Army
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

RE: Draft Environmental Statement - Flood Protection on the Mississippi River Between Sainte Genevieve and Saint Marys, Missouri
DEIS #77-02-031

Dear Mr. Niemi:

Find attached additional comments on the referenced subject. Please consider these comments and respond to item number six. Has the deficiency mentioned in item number six been corrected?

I look forward to your response.

Respectfully,

T. E. Hornbacker, Director
Illinois State Clearinghouse

TEH:jd
Attachment
cc: Richard Lutz, Il Department of Conservation
John K. Flowe, Il Department of Transportation

Illinois Department of Transportation
Division of Water Resources
2300 South Dirksen Parkway/Springfield, Illinois/62764

May 13, 1977

MEMORANDUM TO T. E. HORNBACKER

FROM JOHN K. FLOWE

SUBJECT: DRAFT EIS - FLOOD PROTECTION ON THE MISSISSIPPI RIVER BETWEEN STE. GENEVIEVE AND ST. MARY'S, DEIS #77-02-031

Flood control interests of the Division of Water Resources are restricted to urban flood damage abatement. The following comments are offered in response to urban flood features of the proposed project:

1. The project does not represent an optimum levee height, largely because of sociological constraints.

2. The National Economic Development plan is relocation of floodable structures in conjunction with fish and wildlife and other land management. Such nonstructural measures have been zealously urged by Illinois, other states, the Congress, and parts of the Corps hierarchy. The St. Louis District reports that dehabitation is not acceptable to the local sponsor. Note the NED plan has no non-federal costs.

3. The project is not economically feasible at the current discout rate (6-3/8%). The grandfathered discount rate (3-1/4%) has been approved by Congress and accepted by the President in this particular case.

4. The sixfold cost increase since authorization is the result of inflation and reformulation, both of which are necessary to project financial feasibility.

5. No future urban development is projected for "with project" or "without project" conditions. This is consistent with State and Federal policy on structures in floodprone areas.

6. The project will induce damages at St. Mary's ($3,000 per year) and Ste. Genevieve ($7,000 per year). These values are correctly discounted from project benefits. However, the plan contains no mechanism for compensating the damaged parties at those two places, and therefore is incomplete.

The Division of Water Resources has no intent or interest in assisting the local sponsor. No assistance has been requested. Therefore, it would be inappropriate for the Division to reject the plan, on the basis of foregoing deficiencies.

In October of 1975, the Department of Conservation indicated an interest in fish and wildlife benefits which might be obtained with the project through cooperation between concerned agencies. In view of potential project impact on habitat and wetlands, perhaps the Department of Conservation might be interested in perpetuating these habitat through public investment.

JKF:er
Enclosures

ILLINOIS ARCHAEOLOGICAL SURVEY

109 DAVENPORT HALL UNIVERSITY OF ILLINOIS URBANA, ILLINOIS 61801

Cooperating Institutions:
University of Illinois
Southern Illinois University
Illinois State Museum

February 18, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
Department of the Army
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

Thank you for your letter of February 1, and enclosure of the Draft EIS and the General Design Memorandum - Phase 1 for Flood Protection on the Mississippi River between Sainte Genevieve and Saint Marys, Missouri.

A review of both documents indicates that your office has carefully considered the impact upon the existing archaeological resources, and an excellent survey and inventory has been undertaken for the Kaskaskia Island area. This work is indicated on pages 47 and 63 of the EIS and pages 40-41 and 74 of the General Design Memorandum - Phase 1. The Final EIS should outline in general plans for mitigation of the impact of the project upon these archaeological resources.

Cordially yours,

Charles J. Bareis

Charles J. Bareis
Secretary-Treasurer

CJB/pw

cc: James Porter
Ronald Pulcher

ILLINOIS NATURAL HISTORY SURVEY

Natural Resources Building
Urbana, Illinois 61801

Telephone: 333-6880
Area Code 217

GEORGE SPRUGEL, JR., *Chief*

February 28, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
LMSED-BP
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

Dear Mr. Niemi:

As requested, the Illinois Natural History Survey has reviewed the draft copies of Phase I General Design Memorandum and the Environmental Statement for the Kaskaskia Island Drainage and Levee District.

The Survey has no comment to offer other than though we recognize the improvement in wildlife habitat likely to obtain from construction of the borrow pits, we regret the destruction of agricultural crop land for this purpose.

Sincerely yours,

George Sprugel, Jr.
Chief

GS:aa

Southern Illinois
University at Carbondale
Carbondale, Illinois 62901

Department of Geography

March 4, 1977

Jack R. Niemi
Chief, Engineering Division
Department of the Army
St. Louis District, Corps of Engineers
210 N. 12th Street
St. Louis, MO 63101

ATTN: LMSED-BP

Dear Mr. Niemi:

Enclosed please find a brief statementanent the Kaskaskia Island environmental impact statement as prepared by your office. Since the "General Design Memorandum Phase 1 Plan Formulation" in essence duplicates the Impact Statement, I wrote all of my comments on the Impact Draft.

My comments are yours for inclusion in the document.

Yours,

A. D. Horsley
Assistant Professor

ADH/ss

Enclosure

Reactions and Comments from Dr. A. Doyne Horsley, Department of Geography, SIU-C on Draft Environmental Statement:

"Flood Protection on the Mississippi River
between Sainte Genevieve & Saint Marys Missouri"

As I understand from recent reports, the gravity drain project is no longer included in the project. Thus I have not included any of my original concerns per that expenditure.

In general, the Environmental Input Statement is very well done with complete and apparently accurate documentation. I am particularly pleased with the attention the U.S. Army Corps of Engineers has given to the examination of the "impact of the project" on the local environment. Nonetheless, I have a few concerns which I wish to raise for your consideration.

1) I found one typographical mistake on page 9 in the date of the first flood. Should it read "1844"?

2) Would on page 4, the Age-Sex Pyramid be more functional and visually useful if actual number of population were listed along with the percentages in each age group.

3) Section 2.35 page 42-45 seems to be a viable argument but there is no supporting evidence given. The "community espirit de corps" can be documented and quatified just as soils or other physical data are.

4) Page 49, Section 2.43 is a beginning to a potentially strong argument for the project; but the statement leaves this analyst with incomplete evidence to such positions as "growth... is not anticipated etc." This could be strengthened by using the information on page 51 about "insurance rates" impact on future growth. However, on page 57, Section 4.3.1.1 you comment that some residents may return once the project is finished. Are these points compatible?

5) Page 51 - The statement on flood insurance seems quite unrelated to the project at hand. Should you tie together the insurance regulations at all with the project? It appears that the insurance program would be undertaken as planned with or without the "levee raising project".

6) Once the levee is raised, will there be "riprap" or some other covering used to decrease slumping of the levee due to the regular rains in the area?

7) Will the burrow pits cause any draw down of interface soil moisture at a greater rate in those farm lands near the pits?

8) Statements suggest that population might grow due to levee height increase; but will that occur since levee protection could raise the property and farmstead values to a level that would encourage the selling of land by small farms and an extension of large farmer's holdings in turn.

WAGNER, BERTRAND, BAUMAN & SCHMIEDER
ATTORNEYS AT LAW

PAUL WAGNER, OF COUNSEL

BERNARD H. BERTRAND
JOHN O. BAUMAN
ROBERT W. SCHMIEDER
CHARLES D. WILLIAMSON

121 SOUTH ILLINOIS STREET
BELLEVILLE, ILLINOIS 62220
(618) 277-2400

February 9, 1977

Mr. Jack R. Niemi
Chief, Engineering Division
Department of the Army
St. Louis District, Corps of Engineers
210 North 12th Street
St. Louis, Missouri 63101

In re: LMSED-BP

Dear Sir:

This will acknowledge receipt and thank you for the draft copies of the Phase I General Design Memorandum and the Environmental Statement for the Kaskaskia Island Drainage and Levee District located in Randolph County, Illinois.

I have reviewed both proposals in detail and at the outset wish to compliment you and your division upon the apparent excellent job of securing factual background data and information and the compillation of statistical and historical data.

As you may know, I have been involved in the attempted rebuilding project of Kaskaskia Island as its attorney since 1973 and I am certainly gratified that it now appears that this project will be implemented in the very near future.

A review of the Environmental Statement would appear to be acceptable on its face.

The reclamation of over 9000 acres of rich agricultural land and the preservation of the historical site certainly should have a beneficial environmental impact not only upon the residents of Kaskaskia but on all of the Mississippi Valley area within hundreds of miles.

Be assured that I am wholeheartedly in concert with your recommendations of the selected plan, that is, to increase flood protection from ten years to approximate 50 years frequency which as your report notes, would cause no detrimental effect on either the natural environment or projected natural environment.

With respect to the proposals for the general design for flood protection Phase I would also appear to be the appropriate authorized plan. To raise the levee eight feet and the crown width increased from ten feet to twenty feet certainly would increase the protection to the land and to the residents and hopefully obviate the possibility of a repeat of the devastating flood of 1973.

We note that the cost to benefit ratio is one-to-one for the proposed Phase I plan and consequently, there should be no objections to the product on the basis of economic benefit.

By contrast, the alternative plans of purchasing the island for either a lease back for partial agricultural use, or to devote the entire area to a reversion to a natural state would neither appear to be feasible nor in the best interest of the State of Illinois, the Mississippi Riverway in general and more particularly would be cruel and inhuman to the residents and owners of land on Kaskaskia Island.

We strenuously oppose the alternative plans and hope that your Department will assist in the summary dismissal of the alternative plans from serious consideration.

I will make every effort to attend a public meeting which you are scheduling but in the event that I am unable to attend, I would appreciate your considering this communication as my strong support for your Phase I recommendations as stated and urge that the plans be implemented with the greatest possible speed. Again, I congratulate you and your staff on making a final, effective, decisive and fair decision in recommending the raising of the levee and the broadening of same to prevent a repetition of the flood disaster of 1973.

Very truly yours,

By _____
John D. Bauman, Attorney for
Kaskaskia Island Citizens Committee

JDB:ljy
cc: Ms. Emily Lyons


DATE
FILME
7 — 8