UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
(UMRS-EMP)

STAG ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT (HREP)

POOL 25
MISSISSIPPI RIVER
LINCOLN COUNTY, MISSOURI

FINAL

DEFINITE PROJECT REPORT (SL-9)
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

February 1998

US Army Corps
of Engineers
St. Louis District

FINAL

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM- DEFINITE PROJECT REPORT (SL-9) WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

STAG ISLAND HABITAT REHABILITATION AND ENHANCEMENT PROJECT

POOL 25, MISSISSIPPI RIVER LINCOLN COUNTY, MISSOURI

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February 1998

EXECUTIVE SUMMARY

The Stag Island Habitat Rehabilitation and Enhancement Project (HREP) is located in Lincoln County, Missouri, near the downstream end of Pool 25, between river miles 247.7 and 249.5. The project area consists of a complex of four islands and surrounding off-channel aquatic habitats located on the inside bend of the river, and totals 486 acres. The four islands are mainly forested and lie low with respect to the river. Aquatic areas include main channel border, side channel, chute, main channel, and island slough habitats.

Sedimentation has eliminated or significantly degraded productive off-channel habitats in Pool 25, especially backwaters, which serve as valuable spawning, rearing, and overwintering areas for riverine fish. Suitable slackwater habitat for migratory waterfowl, especially diving ducks, is also in short supply. On Stag Island itself, sediment "plugs" have formed in the opening of two sloughs, preventing optimal moist soil plant production in these areas in conjunction with Pool 25 water level manipulations for habitat improvement.

The objectives of this project are to decrease sedimentation in the side channel between Stag Island and the Missouri shore, create high-quality winter habitat for fish, accumulate and maintain aquatic habitat structure (e.g., fallen trees, submerged logs, brush, etc.), create slackwater habitat for migratory waterfowl, and improve the slough habitats on Stag Island. After considering a full range of alternatives, the preferred plan was developed. To correct the local problem of sedimentation at Stag Island, and to enhance the surrounding habitat in general, a simple, cost-effective, single-component project was designed. The project involves the construction of a 1,300 foot long emergent stone dike extending from the Missouri shoreline to the tip of Stag Island. This dike will cross the upper end of the side channel and upper chute. It will have a crown elevation of 438 feet NGVD, or four feet above normal pool (434 feet NGVD). Revetments and rock armoring will be required at the head of Stag Island and at the Missouri bankline, and at the head of the unnamed island between the shoreline and Stag Island.

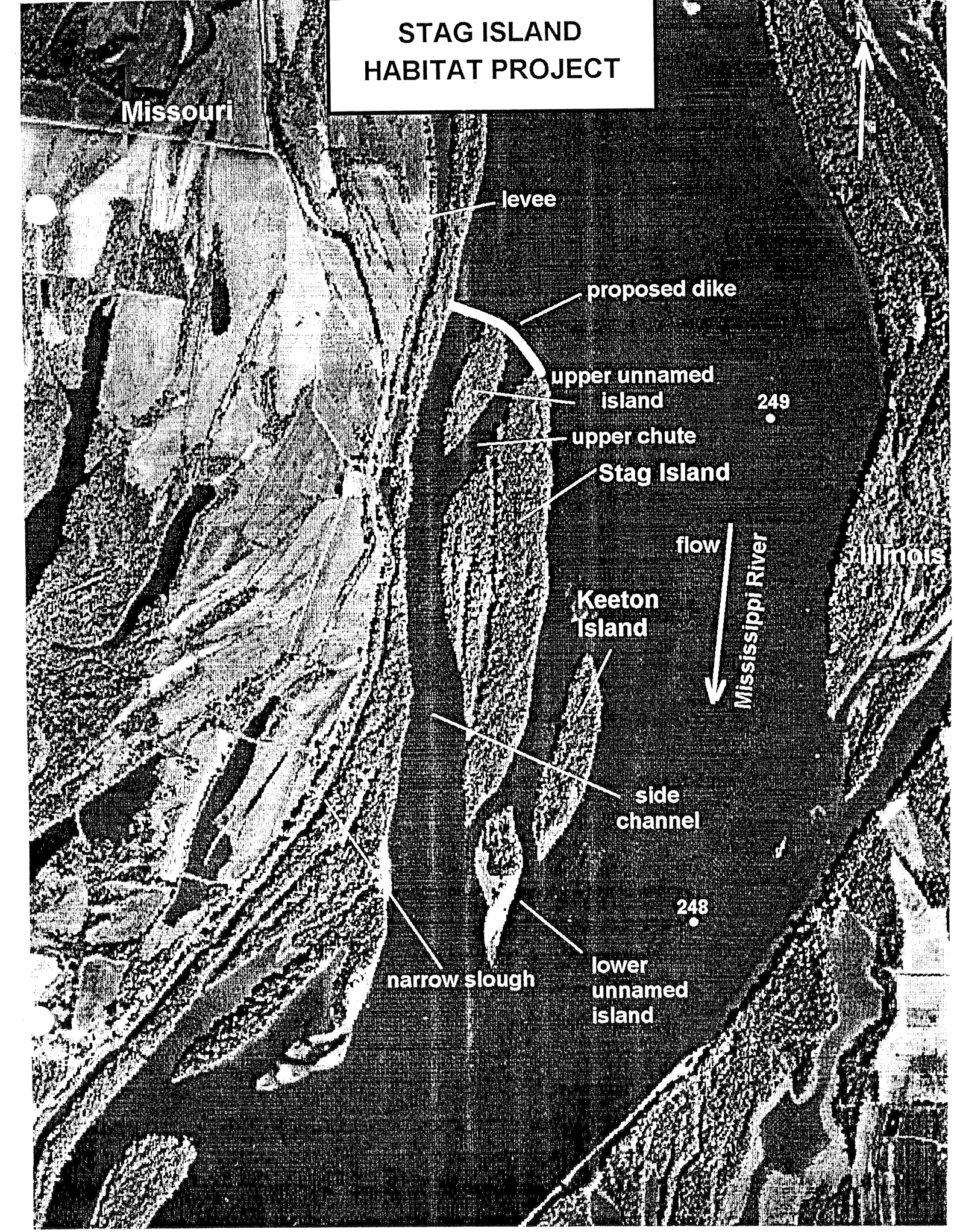
The project will create about 127 acres of slackwater habitat from the 99-acre side channel and 28-acre upper chute. It is expected that sedimentation and turbidity will be reduced by the dike, water clarity will improve, submergent aquatic vegetation will become established, and woody debris will accumulate in the protected area. This slackwater area is expected to serve as spawning, rearing, and overwintering habitat for many riverine fishes, and as resting and feeding habitat for migratory birds, especially diving ducks. The dike is expected to retard the accumulation of sediments in sloughs on Stag Island, and delay the encroachment of woody vegetation in these productive units. Overall, aquatic habitat enhancement from the project would be anticipated to yield a net gain of 101 Average Annual Habitat Units (AAHUs). The project is designed to provide habitat benefits for approximately 50 years.

A Project Performance Evaluation Plan (including physical and chemical analyses) that complies with the scope and methodologies used for other HREPs, and the Upper Mississippi River System-Long Term Resource Monitoring Program (UMPS-LTRM), has been developed. Pre-construction and post-construction monitoring would be implemented at a total annual cost of $7,050 but execution would be contingent upon EMP program reauthorization beyond the year 2002.

MDOC, through a separate agreement with the USFWS, is the local sponsor for the Stag Island project. The USFWS Regional Director, and the St. Louis District Commander, will sign a Memorandum of Agreement (MOA) for restoring fish habitat resources at Stag Island, addressing the specific relationships, arrangements, and general procedures under which the USFWS and Department of the Army will participate in constructing, operating, maintaining, repairing and rehabilitating the project.

The sponsor will accomplish its work in accordance with Section 906(e) and Section 1103(e), as amended, of the 1986 Water Resources Development Act. A manual will be developed during the construction phase of the project which will more specifically define the operation, maintenance and rehabilitation responsibilities.

The total fully funded project cost is estimated to be $856,000. Project construction is scheduled to be completed in September 1999. The single-feature project is located on Federally owned lands. The cost of construction would be 100 percent Federal. The annualized operation and maintenance cost of the project is incurred 100 percent by the agency managing the site (i.e. by the Missouri Department of Conservation).


STAG ISLAND
HABITAT PROJECT
N
Missouri
levee
proposed dike
upper unnamed
island
249
upper chute
Stag Island
flow
Mississippi River
Illinois
Keeton
Island
side
channel
248
narrow slough
lower
unnamed
island

FINAL

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM DEFINITE PROJECT REPORT (SL-9) WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

STAG ISLAND HABITAT REHABILITATION AND ENHANCEMENT PROJECT POOL 25, MISSISSIPPI RIVER, LINCOLN COUNTY, MISSOURI

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REPORT ACRONYMS

AAHU	Average Annual Habitat Unit
AHAG	Aquatic Habitat Appraisal Guide
CM	Construction Management
CMP	Corrugated Metal Pipe
DPR	Definite Project Report
EA	Environmental Assessment
EMP	Environmental Management Program
EMTC	Environmental Management Technical Center
GIS	Geographic Information System
GPM	Gallons Per Minute
HEC	Hydrologic Engineering Center
HREP	Habitat Rehabilitation and Enhancement Project
HSI	Habitat Suitability Indices
HTRW	Hazardous, Toxic, Radioactive Waste
HU	Habitat Unit
LTRM	Long Term Resources Management
MDOC	Missouri Department of Conservation
MOA	Memorandum of Agreement
MTNWR	Mark Twain National Wildlife Refuge
NAWMP	North American Waterfowl Management Plan
NGVD	National Geodetic Vertical Datum
NRCS	Natural Resources Conservation Service
O&M	Operations and Maintenance
PE&D	Preconstruction Engineering and Design
PL	Public Law
SHPO	State Historic Preservation Officer
SLD	St. Louis District
UMRBA	Upper Mississippi River Basin Association
UMPS	Upper Mississippi River System
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WES	Waterways Experiment Station
WHAG	Wildlife Habitat Appraisal Guide

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STAG ISLAND HABITAT REHABILITATION AND ENHANCEMENT PROJECT POOL 25, MISSISSIPPI RIVER, LINCOLN COUNTY, MISSOURI

1. INTRODUCTION.

a. Purpose. The purpose of this Definite Project Report(DPR) is to present a descriptive proposal for a Habitat Rehabilitation and Enhancement Project (HREP) in the area adjacent to and immediately downstream of Stag Island, near Mississippi River mile 249. The DPR presents details of the planning, engineering, and construction of a Selected Plan sufficient to allow final design and construction of the project to follow, once the report is approved. The Environmental Assessment (EA) for the project is integrated with the DPR.

b. Authority. Public Law (PL) 95-502 authorized the construction of a new dam and 1,200-foot lock at Alton, Illinois, and directed the Upper Mississippi River Basin Commission (UMRBC) to prepare a Comprehensive Master Plan for the Management of the Upper Mississippi River System. The UMRBC completed the Master Plan report and submitted it to Congress on 1 January 1982. The report recommended an Environmental Management Program (EMP) that included construction of habitat rehabilitation and enhancement projects.

On 15 August 1985, President Reagan signed into law the Supplemental Appropriations Bill (PL 99-88), which provided initial authorization and appropriations for the recommended environmental management program. A more comprehensive authorization was later provided by Section 1103 of the Water Resources Development Act of 1986 (PL 99-662). Section 1103 is summarized as follows:

Section 1103. UPPER MISSISSIPPI RIVER PLAN

(a) (1) This section may be cited as the Upper Mississippi River Management Act of 1986.

(2) To ensure the coordinated development and enhancement of the Upper Mississippi River System (UMPS), it is hereby declared to be the intent of Congress to recognize that system as a nationally significant ecosystem and a nationally significant commercial navigation system. Congress further recognizes that this system provides a diversity of opportunities and experiences. The system shall be administered and regulated in recognition of its several purposes.

(e) (1) The Secretary, in consultation with the Secretary of the Interior and the states of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, is authorized to undertake, as identified in the Master Plan -

(a) a program for the planning, construction, and evaluation of measures for fish and wildlife habitat rehabilitation and enhancement . . .

2. GENERAL PROJECT SELECTION PROCESS

a. Project Scope. The geographical scope of this project is limited to the Stag Island-Keeton Island complex on the Mississippi River. Of the four islands within the project area, three (Stag Island, Keeton Island, and the unnamed island just downriver) are Federal lands, as is a narrow strip along the adjacent Missouri shoreline. The small unnamed island to the northwest of Stag Island is in state ownership. The Corps acquired the Federal lands about 50 years ago for the improvement of navigation by providing a 9-foot channel in the Upper Mississippi River. The lands were later designated General Plan lands. The March 1961 General Plan was approved jointly by the Assistant Secretary of the Army, the Secretary of the Interior, and the Missouri Department of Conservation (MDOC); and as prescribed in a Cooperative Agreement, dated February 1963, between the Department of the Army and the Department of the Interior. MDOC has responsibility for the day-to-day management of the area under the terms of a cooperative agreement with the U.S. Fish and Wildlife Service. The Stag-Keeton Island complex lies within Missouri's Upper Mississippi River Conservation Area, the primary goal of which is to provide optimum habitat for wetland wildlife species.

A number of field visits were made to the project area to assess water depth, habitat quality, and other environmental characteristics. These site visits have been helpful, especially since the scope of this project has precluded detailed technical field studies. Although site-specific soil borings and sedimentation studies have not been performed, some useful data are available from other HREP reports and documents related to nearby habitat rehabilitation projects (e.g., USCOE 1990, 1995; Laustrup 1995; Lee 1978; Titus et al. 1995). In lieu of extensive modeling or expensive field analyses, technical data from previous studies will suffice for this project.

b. Project Selection Process. In the past, projects have been nominated and ranked for inclusion in the St. Louis District's (SLD) habitat projects program by the respective state conservation agencies, and the U.S. Fish and Wildlife Service (USFWS), based on agency management objectives. The Stag Island project was also developed and prioritized by these same agencies.

c. Project Eligibility Criteria. The UMRBC Master Plan served as the basis for recommendations (including the UMPS-EMP) subsequently enacted into law by the Water Resources Development Act of 1986. A design memorandum (or implementation document) did not exist at the time of enactment of Section 1103. Therefore, the North Central Division, U.S. Army Corps of Engineers,

completed a "General Plan" for implementation of the UMPS-EMP in January 1986. The USFWS, Region 3, and the five affected states (Illinois, Iowa, Minnesota, Missouri, and Wisconsin) participated in the development of that plan through the Upper Mississippi River Basin Association (UMRBA). Programmatic updates of the General Plan for budget planning and policy development are accomplished through Annual Addendums.

The Master Plan report and the General Plan listed examples of potential habitat rehabilitation and enhancement techniques. Consideration of the Federal interest and Federal policies resulted in the following conclusions:

(a) First Annual Addendum. "The Master Plan report... and the authorizing legislation do not pose explicit constraints on the kinds of projects to be implemented under the UMPS-EMP. For habitat projects, the main eligibility criteria should be that a direct relationship should exist between the project and the central problem as defined by the Master Plan, i.e., the sedimentation of backwaters and side channels of the UMPS. Other criteria include geographic proximity to the river (for erosion control), other agency missions, and whether the condition is the result of deferred maintenance...."

(b) Second Annual Addendum. The types of projects that are definitely within the realm of Corps of Engineers implementation authorities include the following:

- backwater dredging
- levee construction
- island construction
- bank stabilization
- side channel openings/closures
- wing and closing dam modifications
- aeration and water control systems
- waterfowl nesting cover (as a complement to one of the other project types)
- acquisition of wildlife lands (as incrementally justified).

A number of innovative structural and nonstructural solutions which address human-induced impacts, particularly those related to navigation traffic and operation and maintenance of the navigation system, could result in significant long-term protection of UMPS habitat. Therefore, proposed projects which include such measures will not be categorically excluded from consideration, but the policy and technical feasibility of each of these measures will be investigated on a case-by-case basis and recommended only after consideration of system-wide effects.

d. Coordination. Since at least 1990 there has been interest on the part of the SLD and MDOC in constructing a habitat restoration project in the Stag Island vicinity. In 1991, SLD prepared a one-page fact sheet (see Section 8) which defined the problem and proposed a habitat restoration solution for the site. The fact sheet summarized the positive outputs of the project, and included estimated construction and annual maintenance costs as well.

In 1996, after a series of meetings and communications between personnel of the District and MDOC, a group of possible or potential project features was developed. By combining different proposed features, a set of 30 unique project plans were created. By mid-1996, consideration of cost and other screening factors decreased the original set of 30 plans to six. Analysis of these six plans then began in earnest. In early 1997, MDOC and District personnel met to discuss the preliminary findings of the planning analysis, which indicated which plan or plans were preferred according to SLD cost, habitat, and technical criteria.

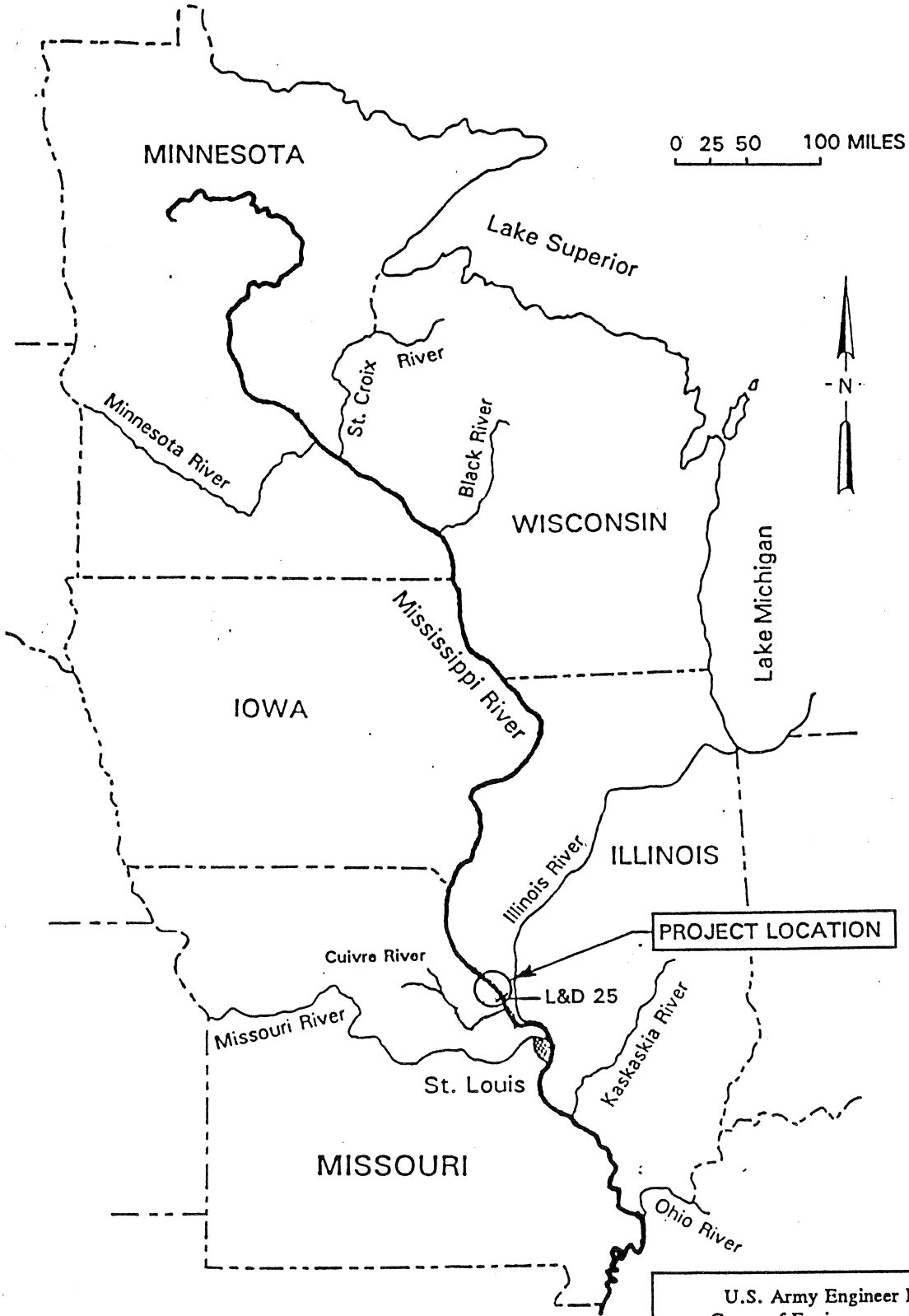
3. DESCRIPTION OF EXISTING RESOURCES

The following section presents descriptive information concerning the physical, biological, and cultural conditions in the project area.

a. Location. The project vicinity is in rural Lincoln County, Missouri, about 25 miles from the western edge of the St. Louis Metropolitan Area (St. Charles), or about 40 miles from downtown St. Louis (see Figure 3.1). The project area is located on the Mississippi River near the lower end of Pool 25. The Stag-Keeton Island complex is between river miles 249.5 and 247.7, and is opposite the north end of the proposed Batchtown EMP-HREP project in Illinois. Figure 3.2 shows a portion of the most recent "Foley, MO-IL" 7.5 minute topographic quadrangle from the U.S. Geological Survey (USGS). This latest USGS quad was published in 1993 and is based on photogrammetric imagery compiled in 1974 and field checked in 1975, with revisions based on 1993 imagery.

b. Physiography and Topography. Stag Island, and the other islands which form the Stag-Keeton Island complex lie in the Mississippi River floodplain about 7.5 miles upstream from Lock and Dam 25. The two named and two unnamed islands in the complex are all low, vegetated sedimentary islands with an average elevation of just over 434 feet NGVD; the normal elevation of Pool 25 is 434 feet. At the north end of the Stag-Keeton complex, the river channel measures about 1.2 miles wide bank to bank; at the south end of the complex, the river is about 0.9 miles wide.

The width of the river channel and the location of the active channel have varied through time. In addition, characteristics of the four islands forming the Stag-Keeton complex have also changed, indicating that the project area is not static. The shapes, margins, areas, and locations of the islands have changed a great deal. Starting in the present, compare Figure 3.2 (the 1993 USGS 7.5 minute "Foley, MO-IL" quad) to Figure 3.3 (the 1934 USGS 15 minute "Hardin, ILL-MO" quad). Moving farther back in time, compare the 1934 map to Figure 3.4, which is a portion of the Mississippi River Commission Chart No. 122, dating to about 1881.



U.S. Army Engineer District, St. Louis
Corps of Engineers St. Louis, Missouri

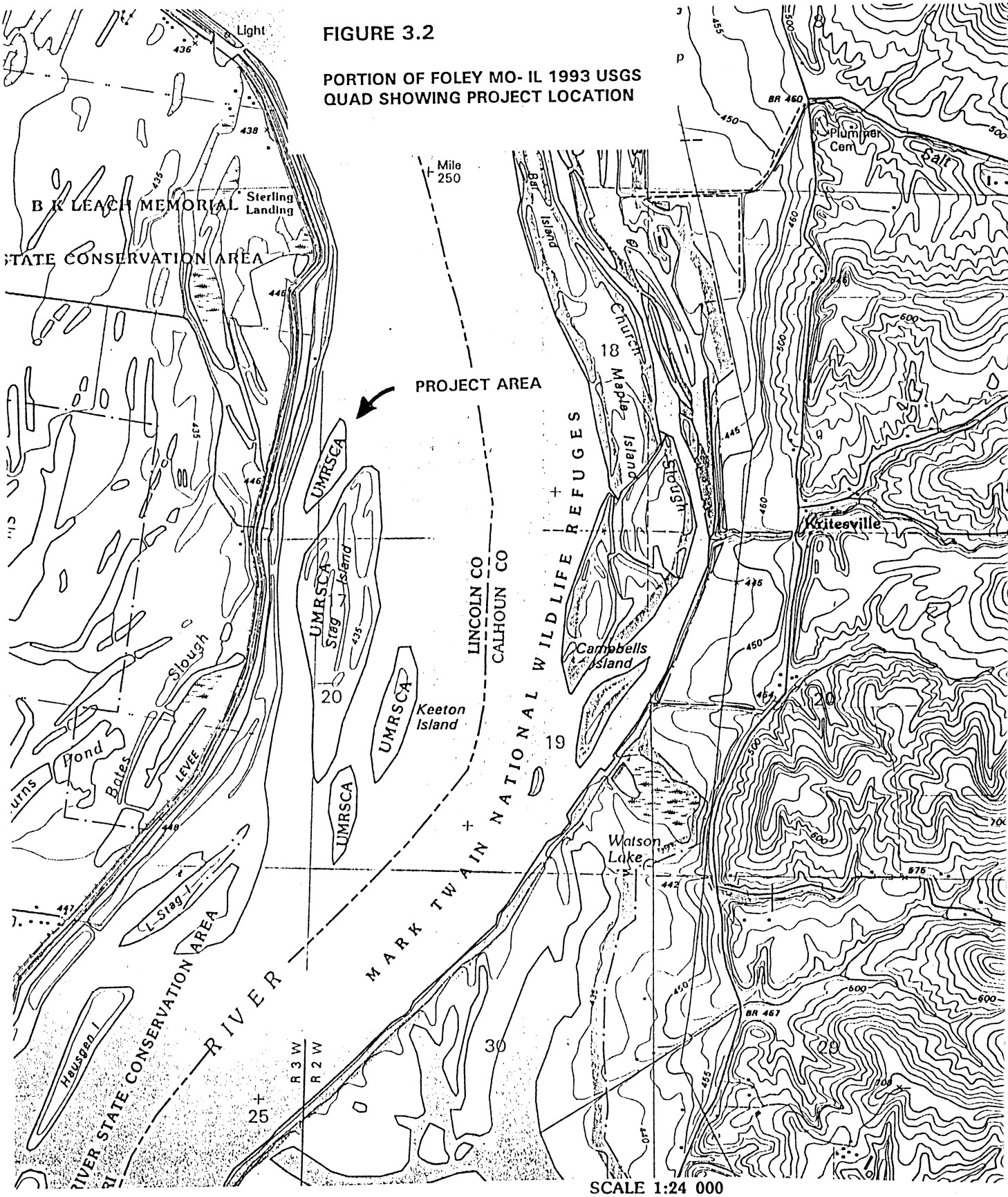
UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM
STAG ISLAND
HABITAT REHABILITATION AND
ENHANCEMENT PROJECT

LOCATION MAP

FIGURE 3.1

FIGURE 3.2

PORTION OF FOLEY MO- IL 1993 USGS QUAD SHOWING PROJECT LOCATION



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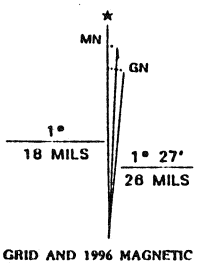


UTM GRID AND 1996 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

1 .5 0 KILOMETERS 1 2

1000 0 METERS 1000 2000

1 .5 0 MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 FEET

CONTOUR INTERVAL 5 AND 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

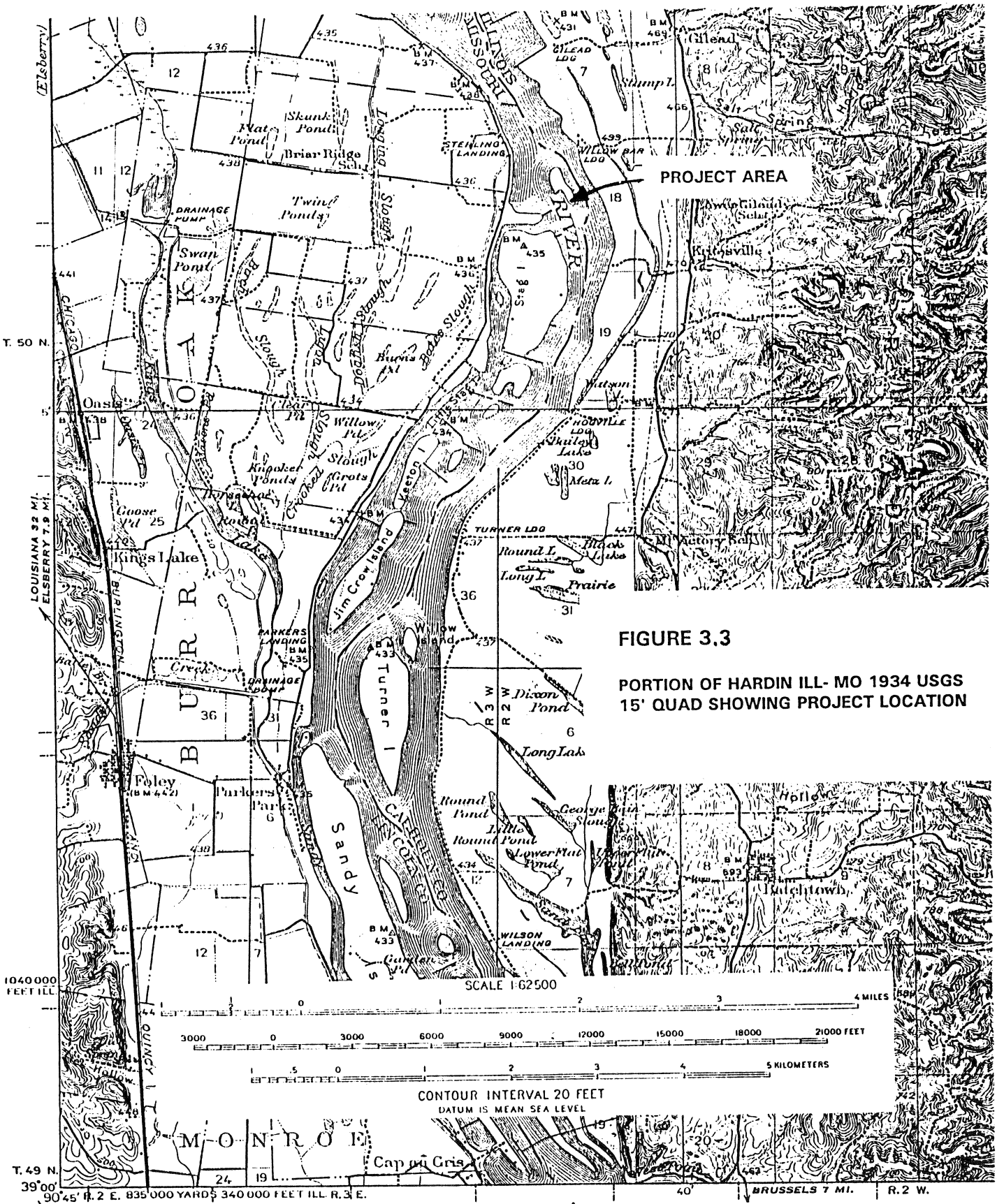
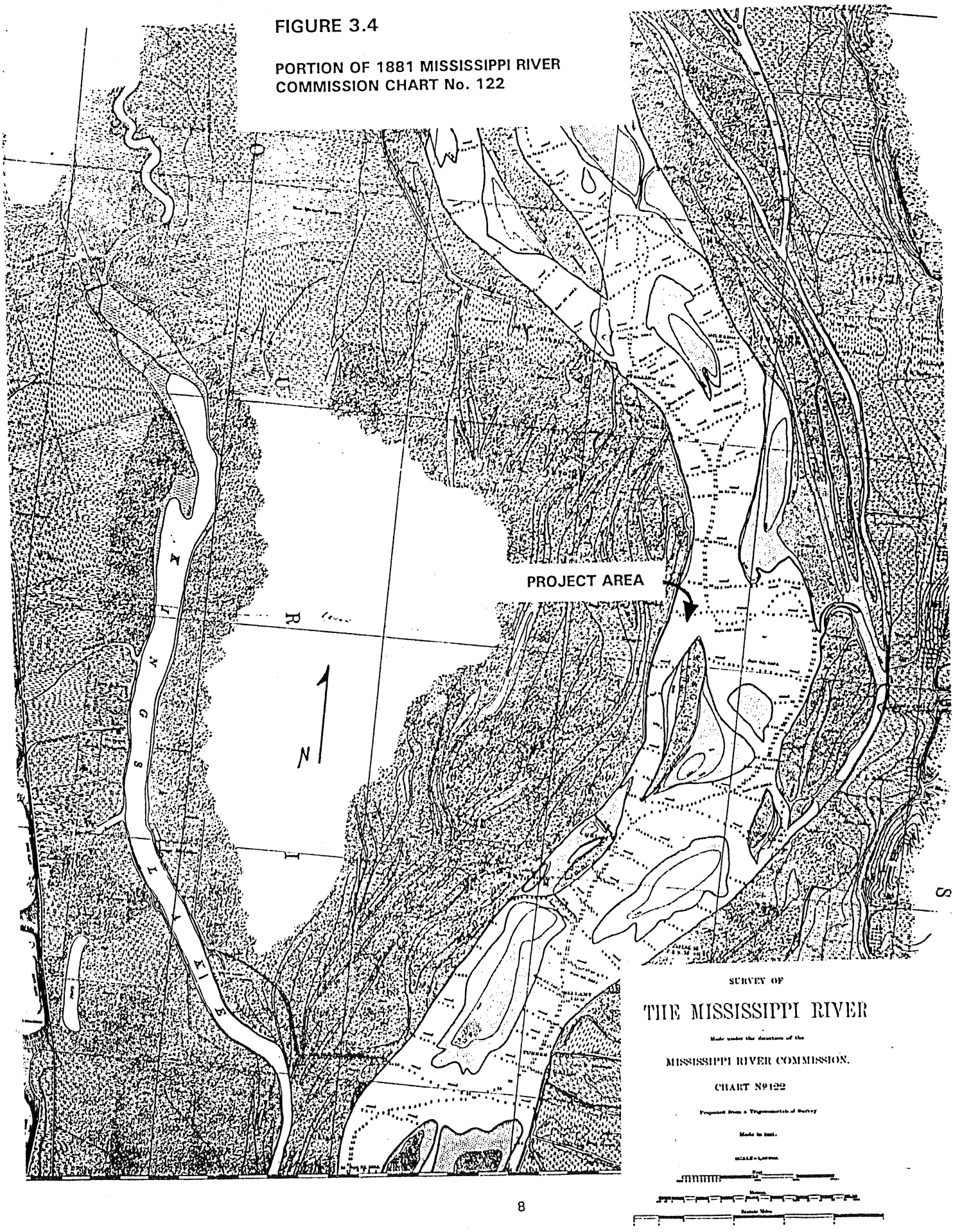


FIGURE 3.3

PORTION OF HARDIN ILL- MO 1934 USGS 15' QUAD SHOWING PROJECT LOCATION

FIGURE 3.4

PORTION OF 1881 MISSISSIPPI RIVER COMMISSION CHART No. 122



c. Hydrology and Hydraulics. Mississippi River stages at Stag Island are controlled, during non-flood river conditions, by the regulation of Lock and Dam 25 at River Mile 241.4. The maximum regulated pool elevation for Lock and Dam 25 is 434.0 ft NGVD, but the pool exceeds this elevation when flows approach bankfull or greater. Less than maximum stage occurs during floods when the pool goes "on tilt" and proceeds to an open river condition. The minimum regulated pool elevation is 429.7. Annually, pool elevations are less than 434 ft. NGVD more than 87% of the time. Table 3.1 presents annual stage-duration data for Lock and Dam 25, and the Sterling Landing Gage. Additional data, including stage-duration curves, annual hydrographs (1939-1996), and basic climatic data for the Pool 25 area, are given in Appendix E.

The Mississippi River discharge and stage-frequency relationships for the reach have been well established from previous analytical and physical model studies. Stage-frequency relationships at the downstream and upstream end of Stag Island are shown in Table 3.2. The flood of record occurred in 1993 and crest elevations reached 447.44 at Lock and Dam 25 and 450.90 at the Sterling Landing gage. (Note: the 1993 flood destroyed the Sterling Landing Gage at river mile 250.8; as of April 1997, the gage has not been replaced).

Because of the low velocities through the navigation pool at average flows, the sediment load which consists of silts and clays settles very slowly. During floods, when open-river conditions exist, the sand load increases significantly. Deposition occurs at all times but is most severe during floods. No records of deposition in the study reach have been kept, but sloughs and side channels within the pooled portions of the river are known to be slowly filling. This loss of off-channel habitats has been recognized as a problem for some time, and is judged to be an order of magnitude of about 1-2 inches of deposition per year. Stag Island and Keeton Island have clearly shown increases in size and area over the years--which is a direct indication of increased sedimentation (see discussion in Section 4).

TABLE 3.1

STAGE DURATION DATA
FOR
LOCK AND DAM 25 AND STERLING LANDING

Lock & Dam 25		Sterling Landing Gage	
Elevation Ft. NGVD	% of Time at or above	Elevation Ft. NGVD	% of Time at or above
448	0	451.00	0
445	.1	448.48	.1
443	.2	446.48	.2
441	.5	445.48	.3
440	.8	444.48	.4
439	1.2	443.48	.7
438	1.9	442.48	1.0
437	2.5	441.48	1.6
436	3.6	440.48	2.4
435	4.9	439.48	3.6
434	12.1	438.48	5.0
433	64.3	437.48	7.0
432	73.1	436.48	9.2
431	80.0	435.48	12.4
430	85.8	434.48	19.3
429	98.1	433.48	78.2
428	98.9	432.48	89.7
427	99.4	431.48	97.2
425	99.5	430.48	98.6
424	99.6	429.48	98.9
423	99.7	428.48	99.0
422	99.8	427.48	99.2
421	99.9	426.48	99.5
420	100.0	425.48	99.6
		424.48	99.8
		423.48	99.9
		422.48	100.0

TABLE 3.2

STAGE-FREQUENCY DATA
FOR
SELECTED LOCATIONS NEAR STAG ISLAND

Frequency (Year)	Mile 241.5 Elevation (Ft. NGVD)	Mile 248.0 Elevation (Ft. NGVD)	Mile 249.5 Elevation (Ft. NGVD)	Mile 250.8 Elevation (Ft. NGVD)
Flood Stage	432.8	435.1	435.7	436.2
5	435.5	438.5	439.2	439.8
10	438.0	440.5	441.1	441.6
50	443.2	445.1	445.6	446.0
100	445.9	447.4	447.7	448.1

TABLE 3.3

AVERAGE ANNUAL DURATION vs. POOL ELEVATION IN FEET NGVD
FOR SELECTED LOCATIONS NEAR STAG ISLAND

Duration % Time (at/or above)	Location RM 241.5	Location RM 248.0	Location RM 249.5	Location RM 250.8
100	420.0	421.7	422.1	422.5
80	431.0	432.3	432.8	443.3
73	432.0	433.1	433.4	433.6
64	433.0	433.5	433.6	433.7
12	434.0	435.0	435.3	435.5
5	435.0	437.4	438.0	438.5
3.6	436.0	438.3	439.0	438.5
2.5	437.0	439.5	440.2	440.6
1.9	438.0	440.2	440.7	441.1
1.0	439.5	441.6	442.0	442.5
0.5	441.0	443.2	443.7	444.2
0.1	445.0	447.4	448.0	448.5
0.0	448.0	450.5	450.8	451.0

d. Aquatic Habitats and Vegetation. Aquatic habitats comprise 76 percent of the 486-acre project area, and consist of five types (see Figure I-1 in Appendix I). They are (from most to least abundant) main channel border (213 acres or 57 percent), side channel (99 acres or 27 percent), chute (35 acres or 9 percent), main channel (20 acres or 5 percent), and island slough (4 acres or 1 percent). Main channel border habitat is located riverside of the islands, and over the submerged wing dike field. Water depths range up to about 10 feet at normal pool, and average about two to three feet. Main channel habitat is the navigation channel, where depths exceed about 10 feet. Side channel is located along the Missouri shoreline landside of the islands. Maximum water depth in the side channel varies from about 10 to 15 feet. There are two chutes, an upper one between the upstream-most unnamed island and Stag Island, and a lower one between Stag and Keeton Islands. The chutes are shallow like most of the main channel border habitat. Two small sloughs are found on Stag Island, a larger one (3 acres) and a smaller one (1 acre). They are only one to two feet deep at normal pool.

Currents exist year round in all habitats but the island sloughs, which are normally calm. Substrates vary from mostly sand in the main channel and main channel border areas, to sandy silts in the side channel and chutes. The bottom in the island sloughs is muddy. Most habitats are devoid of aquatic vegetation, but the island sloughs support a mixture of duckweed and submergents, and emergents such as duck potato (*Sagittaria*) and other moist soil species. In addition to sparse aquatic vegetation, there is little habitat structure within the project area. Less than five percent of the aquatic surface area at normal pool has submerged shrubs, logs or branches, or undercut banks. Two separate sites of main channel border habitat have been used as disposal areas for channel maintenance dredging over the last twenty years. One is inside the upstream or northern project boundary, and the other is riverward of Keeton Island, at the project area's boundary. There are no records of historic or recent occurrence of any Federally or state-listed threatened or endangered plants within the project area (MDOC 1997; see Appendix H).

Between the side channel and a levee paralleling the river to the west, there is a narrow forested corridor, within which runs a narrow slough. At normal pool, the slough is isolated from the side channel by a narrow strip of low land, except for two connection points, one upriver of the project area, and the other opposite the south end of the uppermost unnamed island. Average depth in this slough is only a few feet, and the bottom is silty.

e. Terrestrial Habitats and Vegetation. Twenty-four percent of the project area is terrestrial, and consists of four islands of low elevation: Stag Island (75 acres), Keeton Island (18 acres), the southern unnamed island (17 acres), and the northern unnamed island (9 acres). Terrestrial habitats include forest (106 acres or 92 percent), sandy areas (6 acres or 5 percent), and island sloughs (4 acres or 3 percent, also considered as aquatic). Figure I-1 in Appendix I displays the location of these habitat types. Three dominant types of forest occur: a mixture of silver maple, cottonwood, and green ash (71 acres or 62 percent); a mixture of cottonwood and willow (18 acres or 16 percent); and predominantly cottonwood (12 acres or 10 percent). These tree species associations reflect natural succession on land previously

farmed (on Stag Island over 30 years ago), or on land areas formed by accretion of sediments at different times in the past. Sandy habitat is barren of vegetation and found at the downstream tip of Stag Island. Two sloughs are also located on Stag Island, and they are herbaceous wetlands. Forest and island slough habitats are wetlands subject to Section 404 of the Clean Water Act. Immediately west of the project area is the B.K. Leach Memorial Conservation Area, a 1,413-acre complex consisting of 561 acres of timber, 812 acres of open habitats, and 40 acres of oxbows thaties owned and managed primarily for wetland species by MDOC.

f. Fauna. The principle objective of the Upper Mississippi River Conservation Area, within which the project area lies, is to provide optimum habitat for wetland wildlife species. Terpening et al. (1975) reported the occurrence or suspected occurrence of 416 species of birds, mammals, reptiles and amphibians in floodplain habitats of Pools 24, 25 and 26 of the upper Mississippi and lower Illinois Rivers. The only Federally listed threatened or endangered species that may occur in the project area is the Indiana bat (*Myotis sodalis*, see Appendix H). No state-listed species are known to exist either historically or currently within the project area (MDOC, 1997).

About 285 species of birds are known to use or probably use floodplain habitats of Pools 24-26 (Terpening et al. 1975). The most diverse orders are the perching or song birds, shorebirds and gulls, waterfowl, herons and egrets, and vultures and hawks. The Mississippi River and floodplain is the center of one of the major flight corridors in North America for migrating waterfowl. This mid-migration habitat is recognized in the North American Waterfowl Management Plan as a habitat of major concern. About 20 species of ducks and geese stop during fall and spring migrations to rest, feed and seek sanctuary in wetlands and deepwater habitats of Pools 25 and 26 and adjacent floodplain (Havera 1985). The mallard is the most abundant duck, with the wood duck a close second. In addition to waterfowl, the most common game birds are wild turkey, mourning dove, bobwhite quail, American woodcock, and crow. Sandbars along Stag and Little Stag Islands (the latter is south of the project area) are mowed, when necessary, by the Missouri Department of Conservation to set back woody succession by willow and silver maple. Sandbars in general serve as loafing and feeding areas for bald eagles, shorebirds, and herons. The B. K. Leach Conservation Area serves as important migratory habitat for many migratory wetland bird species, and the area includes a waterfowl refuge located close to the project area's side channel.

About 50 species of mammals inhabit, or are expected to inhabit, floodplain habitats of Pools 24-26, as well as about 75 species of amphibians and reptiles (Terpening et al. 1975). Mammals that may use the islands include opossum, raccoon, muskrat, mink, fox, beaver, squirrel, cottontail, white-tailed deer and a variety of bats and mice. Stag Island and vicinity is used by a variety of turtles, snakes, skinks, frogs and toads.

A diverse fish fauna comprised of 76 species in 19 families is found in Pool 25 of the Upper Mississippi River (Pitlo et al. 1995). The five most diverse families are minnows (18 species), suckers (11 species), sunfishes (9 species), perches and darters (8 species), and catfishes and bullheads (7 species). About 15 species of fish are obtained commercially from Pool 25,

and the important ones include buffalo, channel catfish, carp, flathead catfish, drum, blue catfish, and carpsucker. Many of these fishes prefer to spawn in backwater or side channel habitats where the current is slow and the bottom is muddy or silty. Sunfishes generally prefer to spawn in backwaters and use these areas as general habitat. Main channel and main channel border habitats also serve as spawning habitat for various species. Some species of fish, such as channel catfish and largemouth bass, are unable to tolerate the cold water temperatures and currents of channel habitats. This is especially true of young-of-the-year fish of these two species and is true to some degree for young-of-the-year fishes of nearly all species that inhabit the river (Sheehan et al. 1990). Backwaters provide a refuge from harsh winter conditions for wintering fishes because they generally have warmer water and little or no current. Wintering conditions for fish can deteriorate rapidly if ice and snow cover is of long duration.

g. Environmental Quality. Air quality of Lincoln County, Missouri, and Calhoun County, Illinois (directly to the east of the project area) conforms with the national ambient air quality standards established for carbon monoxide, lead, nitrogen dioxide, ozone, inhalable particulates, and sulfur dioxide. The St. Louis ozone nonattainment area does not include Lincoln County. Because Pool 25 supports much aquatic life, water temperature, pH, and turbidity at the project area are not believed to be a resource problem. Sedimentation of the chute and island slough habitats is apparent, and leads to shallower depths. There are no known hazardous or toxic waste sites in the environs of the project area.

h. Cultural Resources. Comparison of the three maps, spanning the years from the late 1800s to the present (see discussion in section "b." above), indicates that the low-lying sedimentary islands which comprise the Stag Island complex do not represent a static ground surface. Numerous floods and high-water events have washed over the islands, mixing and redepositing the sediments. While no archaeological survey has yet been conducted on Stag or any of the nearby islands, no sites or *in situ* prehistoric materials related to pre-euroamerican cultural activities are expected. This expectation is confirmed, in part, by observations made in Calhoun County, Illinois, directly across the Mississippi River from the Stag Island project location. For the Batchtown HREP, archaeological field surveys and geomorphological corings were conducted (Titus et al. 1995). The field surveys found several prehistoric archaeological sites located on east-west trending ridge and swale structures. These low ridges are apparently older ground surfaces still preserved within the river bottom. Along the riverside levee in Illinois just opposite Stag Island, a series of soil cores encountered "post settlement alluvium" up to 140 centimeters thick. In the Stag-Keeton Island complex, there are no older east-west ridges, and it is expected that recent sedimentation has been at least as extensive as it has been in Illinois. In summary, there are no prehistoric sites on Stag Island.

Similarly, given the gradual sedimentation that has been occurring at normal pool levels, the scouring and redeposition that usually accompanies floods, and the repositioning of the sloughs and side channels over long periods of time, it is not likely that any historic sites or shipwrecks remain intact in the project area. Although District records indicate that two

historic vessels were wrecked in the vicinity of Stag Island, there has been no independent confirmation of these reports. Both ships were reported lost at river mile 248.1, which would be the lower end of Stag Island. The records also indicate that the losses may have occurred on the left descending bank which would normally mean the Illinois shore. However, the "L" notations (for left bank, descending) in these cases may indicate (if indeed one or more ships did founder on Stag Island) that the accident occurred in the channel between the left bank of Stag Island and the Missouri shore.

As a final cautionary note concerning the accuracy of the shipwreck reports, one of the ships reported lost at Stag Island is also reported lost at three other locations on the Mississippi River, between miles 39.4 and 34. It is clear that there is some degree of error in the contemporary sources and newspaper accounts from which the District shipwreck database is derived. Furthermore, there have been no reports of wreckage, cargo, period artifacts, bottles, or other jetsam in the vicinity of Stag Island. In short, despite the two reported lost vessels, there is no evidence of any historic shipwrecks being in the vicinity.

i. Economic and Social Resources. Land use/land cover in Lincoln County is about 50% cropland, 24% pasture, and 26% forest. The principal occupation is farming/agriculture. Major cash crops include corn, soybeans, wheat and hay; livestock consists mainly of beef and dairy cattle, hogs, and poultry (USDA-SCS 1990). There are 189,000 acres of cropland in the county, and the average farm is 250 acres. The value of products sold within the agricultural industry is $52 million with 41.6% deriving from crops and 58.4% from poultry and other livestock (Slater and Hall 1995).

Lincoln County has a population of 31,221 persons. The per capita income for the county is about $15,500 while the median income for the workforce is $28,000 (Slater and Hall 1995). The two nearest towns, Foley and Elsberry, have populations of 209 and 1,898, respectively (1990 census). The flood of 1993 had a significant economic impact on the county due to the floodfighting efforts, lost crops, destroyed residences, flooded or destroyed businesses, and other factors. There are no residences within or adjacent to the project area. Commercial fishing occurs in the Upper Mississippi River, including Pool 25. Total commercial catch in Pool 25 (Missouri and Illinois) ranged from about 100,000 to 200,000 pounds annually over the period 1992-1994 (UMRCC 1994, 1995). The approximate value of these catches per year ranged from $35,000 to $70,000.

j. Recreation and Aesthetics. As part of the Upper Mississippi River Conservation Area, the Stag Island project area is managed by the Missouri Department of Conservation to provide quality outdoor recreation experiences to as many people as possible without detrimental effects to the river and surrounding wetlands. Hunting, trapping, fishing, camping, hiking, bird watching, and nature study are encouraged on the conservation area's lands and waters by MDOC. The four islands within the project area are only accessible by boat. Sandbars along Stag and Little Stag Islands are used as beaches by recreational boaters during the summer months. The nearest public boat ramp is at Norton Woods Access Area in Lincoln County, about two miles upriver from the project area. The Stag Island complex usually experiences heavy use by

waterfowl hunters. It is managed by MDOC as a "restricted" zone, in which blind sites are allocated through a registration system based on randomized drawings. Except for a small number of blind sites, the project area is undeveloped, as is most of the river's shoreline in Pool 25. Outdoor recreational activities are also available at the B. K. Leach Memorial Conservation Area, and include hunting, fishing, primitive camping, and other activities.

4. PROJECT OBJECTIVES

This section identifies and discusses specific components of the degraded habitat problem in the Stag Island area. Discussions include general factors affecting large portions of the UMRS, and more particular aspects more closely related to the Stag and Keeton Island areas. Specific objectives of the Stag Island HREP are also presented here.

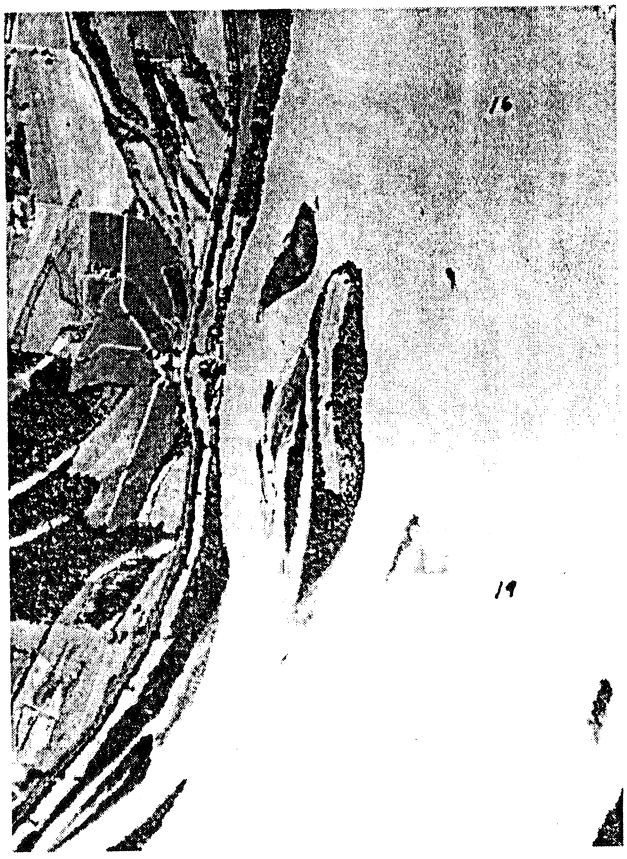
a. Problem Identification. There are at least four interrelated problems which contribute to the degradation of the off-channel habitat in the vicinity of Stag and Keeton Islands.

(1) **Sedimentation of Off-Channel Aquatic Habitats.** One of the major resource problems in the Upper Mississippi River System is the sedimentation of off-channel aquatic habitats, i.e., areas that are lateral of the main channel (UMRCC 1993). This sediment deposition is part of the river's response to erosion of uplands soil, river regulating dikes, flood control levees, and hydrological alterations caused by the navigation locks and dams, and indicates the river is attempting to reach a new equilibrium condition. Off-channel habitats experiencing sedimentation include: (1) side channels, (2) and backwater lakes, which are normally connected to the main channel, and (3) abandoned channel lakes and other aquatic habitats, which are physically isolated from the main river at normal flows.

Laustrup (1995) used Landsat data and digital image processing to conduct a preliminary investigation of gains and losses between terrestrial and aquatic habitats that occurred over the period 1972-1992 from lower Pool 8 to upper Pool 12. His study documented conversions of off-channel aquatic habitats to terrestrial ones through sedimentation (mainly located in the middle and upper portions of the navigation pools), as well as losses of aquatic plant beds and islands to open water. No similar study has been conducted for Pools 24-26 in the St. Louis District. Lee (1978) examined sedimentation within the Batchtown Wildlife Management Area, a large backwater area across the river and about five miles downstream of Stag Island. He determined that this area has been subjected to a net average annual silt deposition of 0.8 inches during the period 1932-1973. Some parts of the area accumulated nearly seven feet of silt (or 1.7 inches per year). Deposition of silt has continued since 1973 at a high rate.

Figure 4.1 displays aerial photos of Stag Island and vicinity from 1956 and 1989, and shows changes due to sedimentation over 33 years. Comparison of the aerial photos shows the formation of two new islands, enlargement of two

Figure 4.1
Sedimentation of Off-Channel Aquatic Habitats
Over 33-Year Period in the Stag Island Vicinity



Date of Photo: 17 Sept 1956
Pool Elevation: 434.1

Date of Photo: 25 Sept 1989
Pool Elevation: 434.2

existing islands, and sedimentation of island sloughs. Similar conversions of aquatic to terrestrial habitats occurred along the Illinois shoreline, but these areas are outside the field of view in Figure 4.1.

The detrimental effects of high sedimentation rates on backwater and side channel habitats are of major concern to resource managers. Besides the gradual conversion of aquatic habitats to forested terrestrial habitats, further declines in the quality of aquatic habitat may occur as a result of a variety of secondary effects. Areas that become too shallow under no flow conditions may experience winter and/or summer fish mortality due to oxygen depletion. Increased turbidity levels frequently accompany sedimentation and may block the passage of sunlight for photosynthesis, thus limiting or eliminating aquatic plant communities. Bottom materials may also be too soft for aquatic plants to produce successful root systems. Loss or severe restriction of the aquatic plant community results in a decline in aquatic invertebrates, a decline in fish spawning habitat and protective cover for fry, and a loss in food sources for aquatic vertebrates such as waterfowl and wading birds. Sediment can also smother the eggs of fish species that spawn on silty or muddy substrates, further inhibiting reproduction.

(2) **Lack of Winter Habitat for Fishes.** One impact of the deposition of sediments has been a decline in the amount of deep water areas available to overwintering fish in off-channel habitats. The Missouri Department of Conservation and Illinois Department of Natural Resources believe that at least seven to eight feet of depth is necessary to safely overwinter fish without a danger of oxygen depletion and the subsequent loss of fish life. In addition, adult and sub-adult fish may overwinter successfully in off-channel habitats with current, but flowing water is generally considered detrimental to overwintering fingerlings (Sheehan et al. 1990). The area known as "Big Hole" within the Batchtown Wildlife Management Area has been documented as an important wintering area for fish in Pool 25 (Sheehan et al. 1990). It is protected from current, but the area exceeding seven feet is very small, probably less than 0.1 acres. Sheehan et al. (1990) also studied overwintering habitat at Gilead Slough, about two miles upstream from Stag Island on the Illinois side, where maximum depths were 6.5 feet and water temperatures were less stable than at "Big Hole". Although a system-wide survey of Pools 24-26 has not been conducted to identify remaining areas that are both deep and protected from currents, fisheries resource managers believe that good overwintering habitat is very limited.

(3) **Lack of Aquatic Habitat Structure.** Aquatic habitat in the vicinity of Stag Island has little structure such as submerged logs, inundated timber, undercut banks, or brush.

(4) **Suboptimal Moist Soil Management in Island Sloughs.** Repeated river flooding has deposited sediments over time in the entrances of two sloughs on Stag Island. The accumulated sediments act as a "plug" and impede the drainage of water from these sloughs when Pool 25 is lowered, either naturally or intentionally as part of pool water level manipulations made by the St. Louis District to benefit fish and wildlife habitat. Water in these sloughs hinders the production of native moist soil plants for the benefit of fish and wildlife. Germination and growth of moist soil plants requires a

gradual drawdown during the late spring or summer to expose muddy substrates. Seeds produced by many species of moist soil plants are desirable foods for fall-migrating waterfowl. It is desirable that subsequent flooding of these sloughs occur after seed production, or else young plants would die from drowning or seed development would be interrupted.

b. Project Objectives. An interagency team of biologists, representing the Missouri Department of Conservation, the U.S. Fish and Wildlife Service, and the St. Louis District, developed five habitat objectives for the project area. They are:

Reduce sedimentation and turbidity in the side channel located between Stag Island and the Missouri shoreline.

Create deepwater slough habitat, including overwintering habitat for fish.

Maintain and accumulate fallen woody debris along banklines of islands and the mainland.

Create slackwater habitat for migratory waterfowl.
Improve slough habitat on Stag Island for moist soil management.

Unlike some other recent EMP-HREP projects, no plans for tree planting or other forest improvements were developed because the four islands in the project area are relatively low in elevation and subject to frequent flooding, existing forest does not support mast-producing tree species, and tree mortality after the 1993 flood was not significant.

5. ALTERNATIVES

Project alternatives were formulated and evaluated in a five-step process. First, general evaluation criteria were established. Second, various measures were identified which addressed the project goals. Third, the measures were evaluated for their overall viability. Fourth, based on the most promising measures, a restoration plan was developed. Fifth, the resulting plan and the no action plan were evaluated against the pre-established rating criteria.

a. Criteria. The four general criteria used in formulating and evaluating the project measures and plans were as follows:

(1) **Completeness.** The extent to which an alternative addresses all of the stated project objectives.

(2) **Effectiveness.** The extent to which an alternative alleviates the specified problems and achieves the specified objectives.

(3) **Efficiency**. The extent to which an alternative is the most cost effective means of alleviating the specified problems and realizing the specified objectives.

(4) **Acceptability**. The workability and viability of the alternative plan with respect to acceptance by the sponsoring agencies, and compatibility with existing laws, regulations, and public policies.

b. Measures Available. Alternative measures identified to meet the planning goals/objectives are described below. These measures were identified through meetings, consultation, and other communications between agency and Corps personnel. Five of the measures discussed are dependent upon the use of an emergent rock dike as the main project feature.

(1) **No Action**. This measure would consist of no Federal funds being provided to meet the project purposes.

(2) **UMRS Watershed Erosion Control**. This measure calls for a major reduction in uplands soil erosion within the UMRS watershed in order to achieve a reduction in sediments reaching UMRS backwaters, including those backwaters at Stag Island. The Natural Resources Conservation Service (NRCS) has developed curves relating soil erosion rates to land use cover types. It is well known that farmland areas and stream and bed erosion produce much of the sediment delivered to the river system. This sediment is transported to the river during periods of heavy rainfall and heavy surface water runoff. Such periods correlate well with periods of river flooding. Major flooding in the St. Louis region generally occurs during late spring and early summer.

(3) **Navigation Pool Water Level Manipulation**. This measure calls for the Corps to modify its water level management procedures at Lock and Dam 25. Changes would be made to better accommodate fish and waterfowl habitat requirements within Pool 25, including the area of Stag Island.

(4) **Regular Maintenance Dredging**. This measure would consist of major backwater excavations as the sole means of restoring and maintaining specific habitat types within the Stag-Keeton Island complex.

(5) **Build Emergent Dike**. This measure would entail the installation of an emergent rock dike or dikes to accomplish the project objectives. Four different locations for dike placement were identified; two combinations of two dikes each were also considered. Thus, a total of six possible dike placements were considered.

(6) **Measures Contingent Upon Building of Emergent Dike**. The five following measures are dependent upon the construction of an emergent rock dike. None of these "sub-measures" would be used by themselves; their use is contingent upon the selection and placement of specific dike configurations.

A. **Install Gate in Emergent Dike**. This measure would add a gate to regulate water flow through the emergent dike. The gate would be utilized in only three of the proposed dike configurations, placed at essentially the same mid-point location in each.

B. **Notch Existing Wing Dikes, Dredge Channel Between Notches.** This measure consists of notching various old submerged wing dikes located behind selected new emergent dikes, and then subsequently dredging a channel between the notched sections. A number of older, submerged wing dikes exist in the vicinity of Stag and Keeton Islands. This measure assumes that these submerged dikes protrude from the river's bottom. Notching and dredging would create a channel for boat access by MDOC personnel, and it was assumed this channel would allow for water flow through the dike field and into the area behind the emergent dike. This measure would be implemented for five of the six emergent dike configurations, in a manner specific to each configuration.

C. **Create Dredge Disposal Area.** This measure involves the placement of round or oval concentric ring structures in specific locations behind an emergent dike. Locally derived river dredge material would be used to build the rounded habitat-enhancement structures. These built-up rings would be placed in a protected location on the east side of Stag Island.

D. **Open Slough on Island with Dredge Cut.** A "plug" of sediment at the downstream end of two interior sloughs on Stag Island would be removed by a dredge operation.

E. **Install Fish Habitat Structures.** This measure involved the placement of materials or objects which would enhance the fish habitat. For reasons discussed in the Measures Evaluated section below, this proposed measure was not developed beyond the most basic suggestion stage.

c. Measures Evaluated. This section provides an evaluation of the available project measures. The measures were evaluated in a two-step process. First, they were screened for viability based on the basic criteria. Then, if warranted, they were subjected to a habitat evaluation/quantification exercise and an incremental cost analysis.

(1) **No Action.** This measure was not found to be viable. Taking no action would do nothing to address the stated planning objectives.

(2) **UMRS Watershed Erosion Control.** This measure was not found to be viable. The Stag Island vicinity is small compared to the entire Pool 25 area. The limited scope and small scale of the Stag Island HREP does not lend itself to a system-wide solution such as erosion control. While Corps personnel and other Federal, state, and local agencies recognize the problem of natural watershed preservation and farmland erosion control, this measure is not really applicable to the Stag Island HREP.

(3) **Navigation Pool Water Level Manipulation.** This measure was not found to be viable for the Stag Island location. For three years beginning in 1994, SLD has been conducting an experiment involving the manipulation of pool levels in order to achieve specific environmental goals. In cooperation with MDOC, these experiments have found that environmental enhancements can be achieved while maintaining river navigation depths, as required by Congress. The District plans to further study the feasibility of this approach under Section 1135 authority. However, this approach would not address one very key concern of the EMP in general and of Stag Island in particular. Pool

regulation does not directly address the problem of sedimentation in the pools. Sediments gradually filling side channels is the main cause of habitat degradation at the Stag Island complex.

(4) **Regular Maintenance Dredging.** This measure was not found to be viable. While dredging is an effective response to the problem of sediment accumulation, it is an inefficient solution to the objectives of the Stag Island HREP. The small scale of this project requires a cost-effective means to stop or control local sedimentation; but dredging 100 acres of backwater habitat to a depth of 8 feet would cost over $2,000,000. In addition, the off-channel areas around Stag Island might have to be dredged more than once during the life of the project. Maintenance dredging would be expensive and it would repeatedly disturb existing and newly developed fish habitats in the area. Considering the high acreage requirement for dredged material disposal areas, and the adverse impacts to existing habitats, this measure would not be viewed favorably by the regulatory agencies.

(5) **Build Emergent Dike.** This measure was found to be viable. In this application, a rock dike is a complete or nearly complete solution to the problem of sedimentation. An emergent dike is also judged to be effective, efficient, and acceptable according to the project criteria.

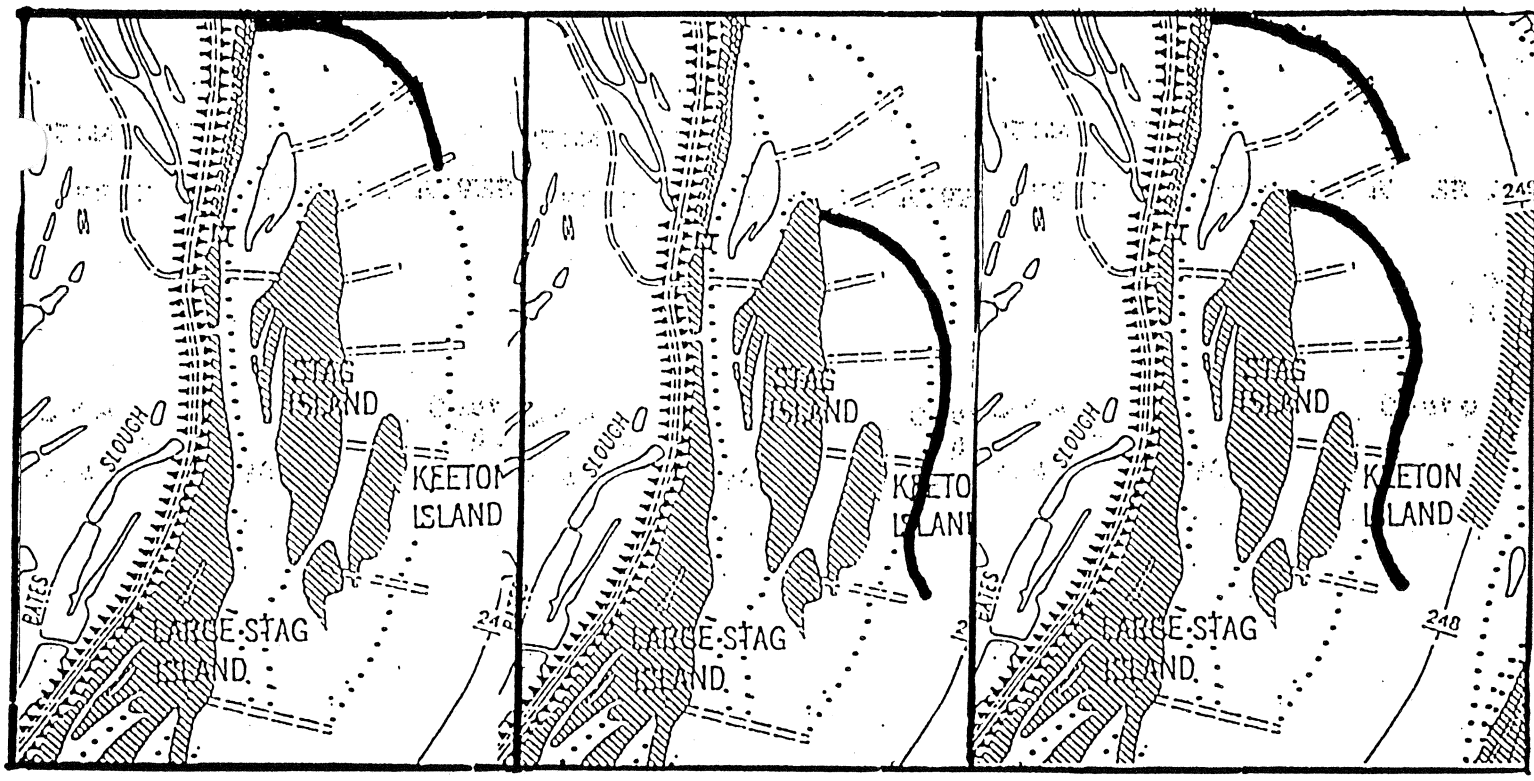
During the early planning stages of this project, six dike placements and configurations were proposed, as shown in Figure 5.1. Preliminary analysis of cost versus project goals indicated that three of the six proposed alignments were cost prohibitive. That is, the probable positive effects on the aquatic habitat was not acceptable, given the estimated cost, for dike alignments "B", "A+B", and "B+D". However, project goals and objectives were met by rock dike alignments "A", "C", and "D". Emergent dike elevation increments of two, four, and six feet above the normal pool elevation of 434 NGVD were considered for these latter three alignments.

(6) **Measures Contingent Upon Building of Emergent Dike.** For each of the following five contingent submeasures, viability was assessed individually using the same criteria applied to the main measures.

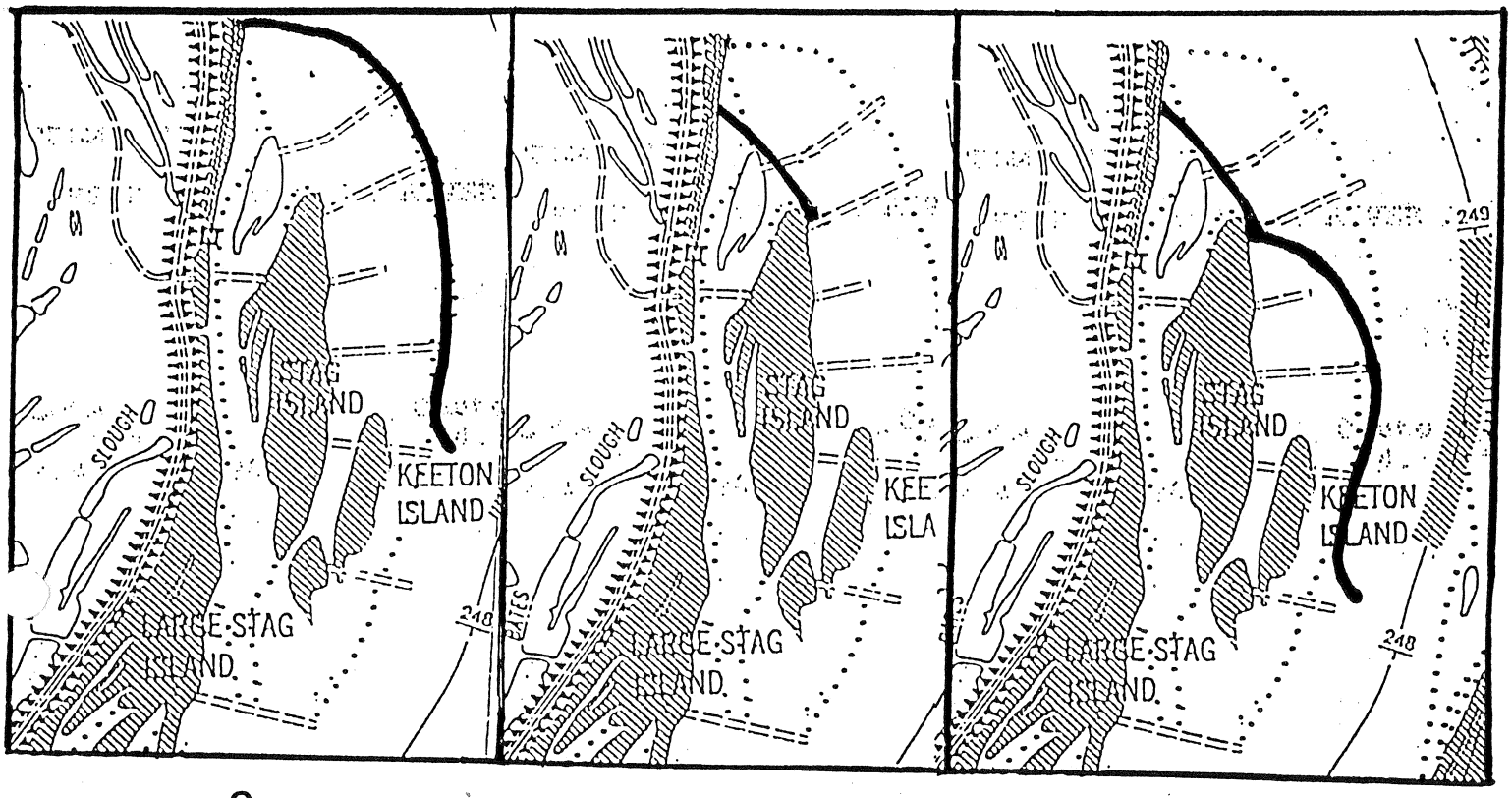
A. **Install Gate in Emergent Dike.** This measure was not found to be viable. After further investigation, both agency and Corps personnel felt that a gated structure would be both ineffective and inefficient. Sediment and debris accumulation upstream of the emergent dike and gate would require substantial future Operations and Maintenance (O&M) expenditures to keep the new gate open and functional. Without any gated structure, concern for the creation of stagnant water conditions in the area behind the new emergent dike was allayed because of the presence of the narrow slough immediately west of the island complex. It would remain open, and would supply fresh water to the side channel after the placement of an emergent rock dike.

FIGURE 5.1

PROPOSED EMERGENT ROCK DIKE ALIGNMENTS



A B A+B



C D B+D

B. **Notch Existing Wing Dikes, Dredge Channel Between Notches.** This measure was found to be viable. During early plan formulation for the Stag Island HREP, examination of maps and charts of the project area revealed the presence of seven or eight submerged dikes within the vicinity. Without detailed hydrographic surveys of the area surrounding Stag Island, it was feared that some of the proposed emergent dike placements would combine with the existing (old) wing dikes to form shallow, slackwater areas impenetrable by boat. A measure was formulated which addressed this potential problem, and which ensured that MDOC could access all parts of the project area by small boat. With emergent dike configurations that would cross or contact more than one submerged dike, a notch would be cut in each old dike, and an access channel would be dredged between the notches.

A second potential benefit of this measure is that the new access channel could allow some main channel waters to flow into the newly protected area, and help maintain interior oxygen levels during stressful hot summer months. The assumption that this would occur was not proven. Figure 5.2 shows the locations of the notched submerged dikes, the associated boat access channels, and the specific dike placements which might benefit from this measure.

C. **Create Dredge Disposal Area.** This measure was not found to be viable. Corps and agency personnel all felt that this type of measure, a beneficial use of dredge material, would be better accomplished under one of the District's "Avoid and Minimize" projects.

D. **Open Slough on Island with Dredge Cut.** This measure was found to be viable. The normal elevation of Pool 25 has allowed two of the larger interior swales on Stag Island to be maintained as sloughs, open on their downstream ends. The larger slough is near the middle of the island, downstream of the second, smaller slough. Both sloughs have openings to the side channel on the west side of Stag Island (see FIGURE 5.3).

At the present time, sediments have built up in the mouths of both sloughs that block the flow of water at normal pool elevations. This measure would open the larger slough, the smaller slough, or both, depending on the increment chosen. The sediments would be removed by dredge operation, allowing access to the interior, slack water habitat in the sloughs.

E. **Install Fish Habitat Structures.** This measure was not found to be viable. When it became apparent that an emergent dike probably would be a component of the selected plan, Corps and agency personnel all agreed that the addition of artificial fish habitat structures would be unnecessary, inefficient, and costly. Once an emergent dike is constructed, natural tree die-off would continue, but would result in the accumulation along the side channel and island shores of woody fish habitat structure.

FIGURE 5.2

CONTINGENT MEASURE:
NOTCH SUBMERGED WING DIKES AND DREDGE CHANNEL BETWEEN NOTCHES

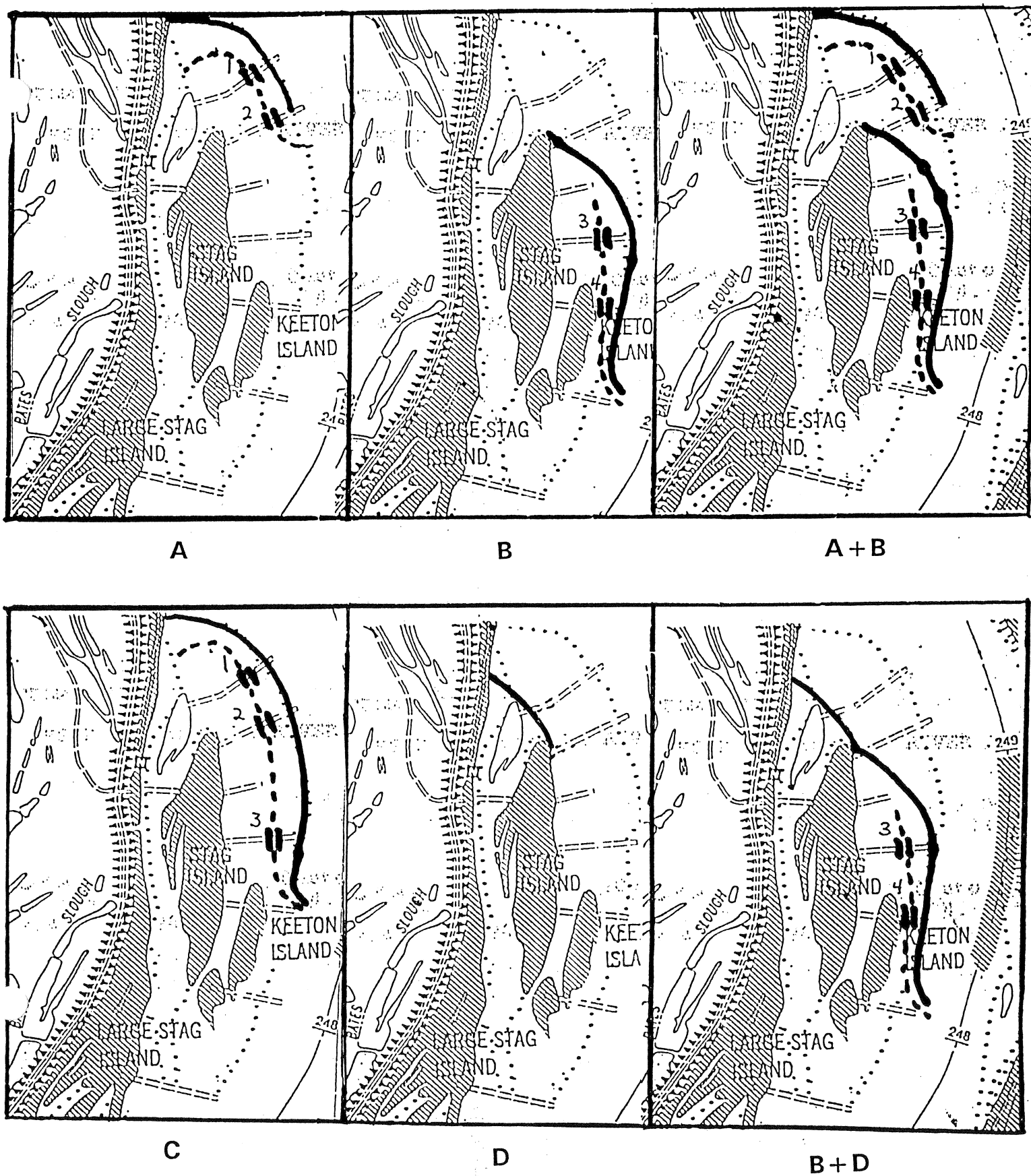
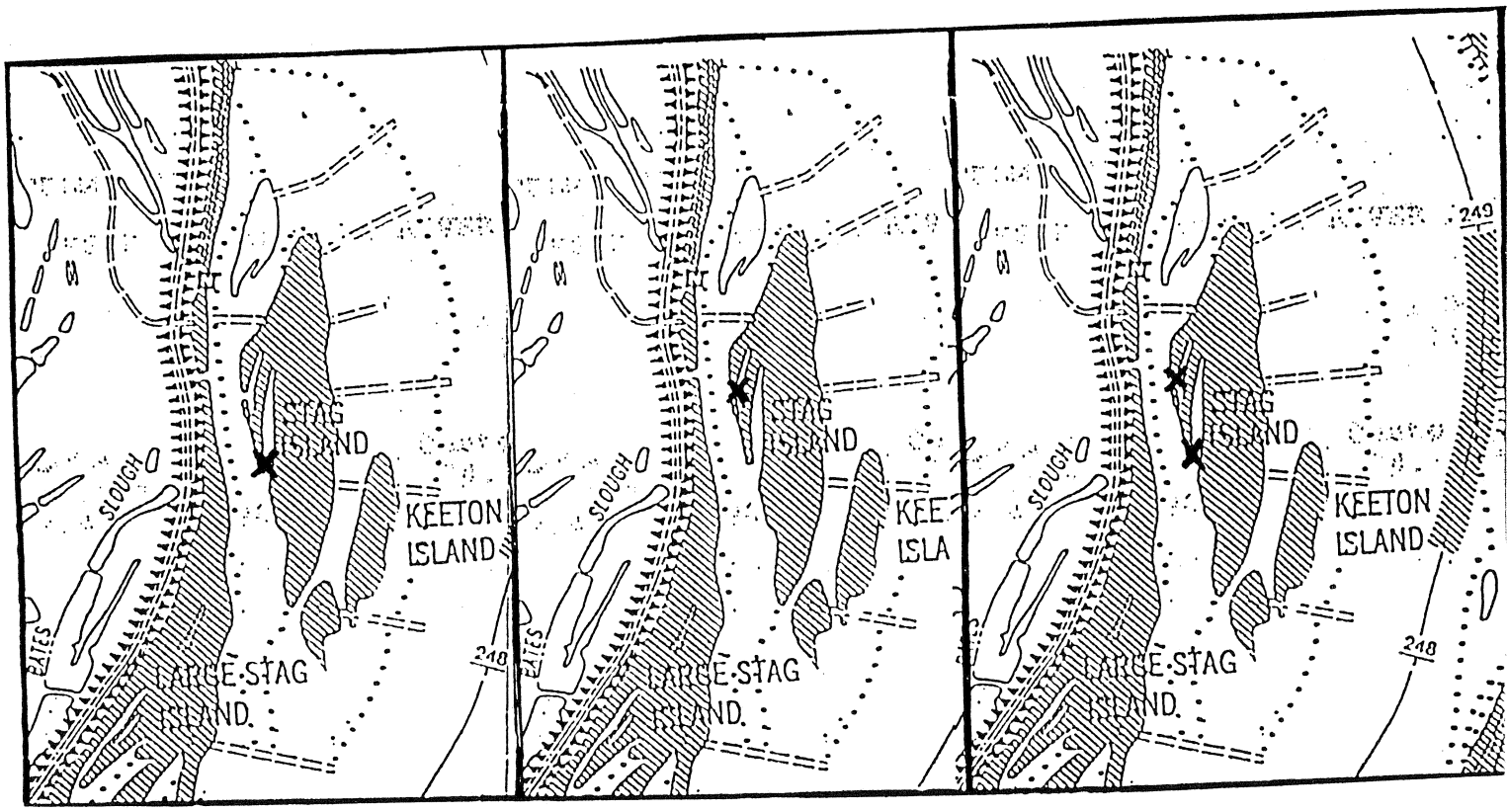


FIGURE 5.3

CONTINGENT MEASURE:
OPEN SLOUGH OR SLOUGHS WITH DREDGE CUT



OPEN LARGE SLOUGH

OPEN SMALL SLOUGH

OPEN BOTH SLOUGHS

6. SELECTED PLAN WITH DETAILED DESCRIPTION

The preferred plan was selected after further review of the available viable alternative measures. This additional review included a quantification of habitat benefits expected for each alternative (described in terms of average annual habitat units, see Appendix I), development of costs for each alternative (described in terms of average annual dollars, see Appendix J), and an incremental cost analysis (see Appendix J), which ranked the alternatives from most to least cost effective. Considering the stated project objectives and keeping in mind the criteria used in formulating the project measures and plans, the most cost effective plan was selected.

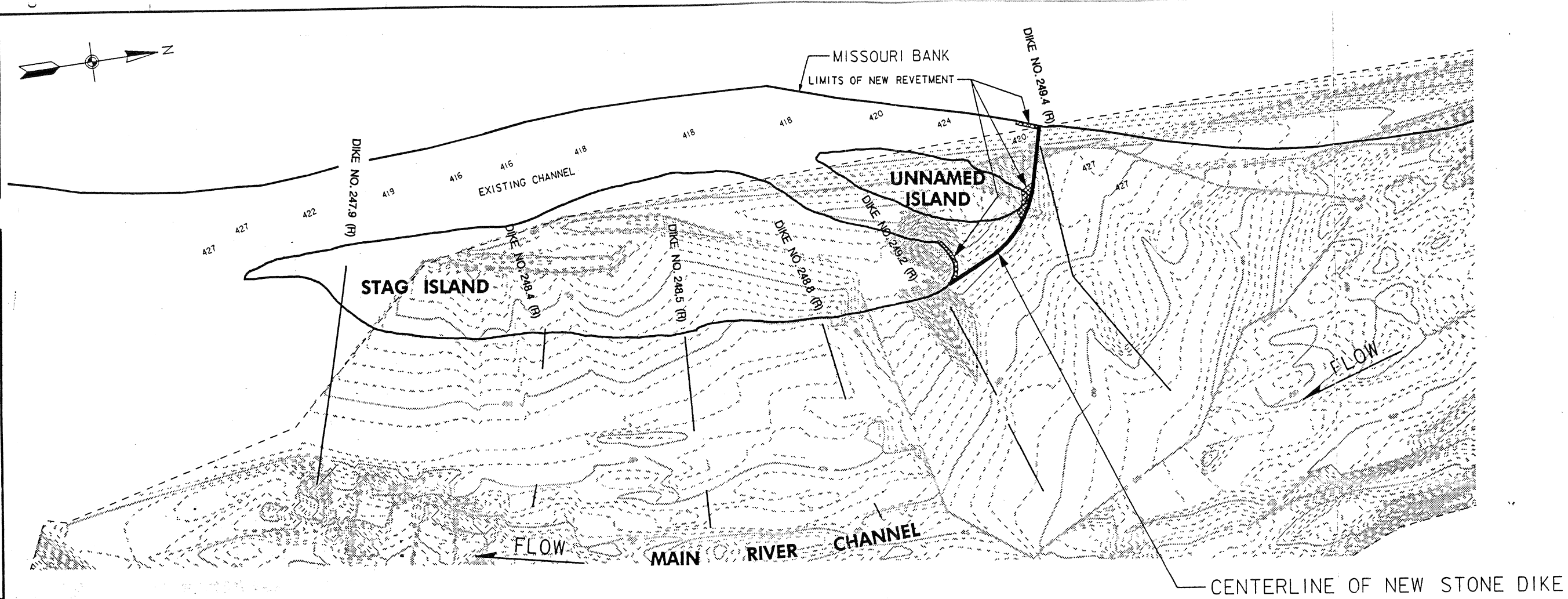
a. Plan Components. The Stag Island HREP is a single component plan (see Figure 6.1). The emergent stone dike configuration identified as choice "D" in the early planning stages is essentially the entire selected plan, and it is a simple design. The dike cross-section consists of a 6 foot wide crown, 1 vertical to 2 horizontal side slopes, and a base width varying between 70 feet and 90 feet, depending on the elevation of the channel bottom along the alignment. The alignment will be placed at or adjacent to a natural ridge where possible as an effort to minimize quantities of construction material. The dike will be tied to the mainland bank and the island with at least fifty feet of root attachment. The dike will be constructed to a height of 4-ft above normal pool (maximum regulated water elevation = 434.00 NGVD). Graded A stone will be used for construction. The dike will be about 1,300 feet long, and will require about 30,000 tons of stone. Revetments and rock armoring will be required at the head of Stag Island at the Missouri bankline, and at the head of the unnamed island between the shoreline and Stag Island.

b. Design Considerations. Stag Island is located in Pool 25 at the approximate river mile 248.0 on the Missouri side of the Mississippi River. The following existing timber dikes were constructed between 1911 and 1912: 249.4 (R), 249.2 (R), and 248.5 (R). The tops of the dikes were constructed to an elevation of 429.0. Current surveys show these dikes to be completely silted in. It is possible that portions of the existing submerged timber dikes may need to be removed before the stone dike can be constructed.

Borings are not required for the placement of stone dikes. However, subsurface information obtained from projects of similar construction in the immediate vicinity has been utilized to predict the amount of settlement expected during stone placement. It can be expected that approximately four feet of settlement may be realized during stone placement.

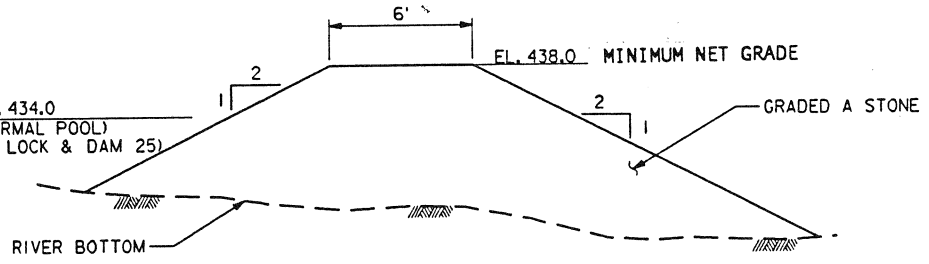
c. Construction Considerations.

(1) **Endangered Species.** The only Federally endangered or threatened species of concern in the Stag Island area is the Indiana bat. The District will place special conditions on the contracted work to ensure protection of the bat and its habitat. The paragraph below, enclosed in quotations, will be enforced by the contracting officer during construction of the project.



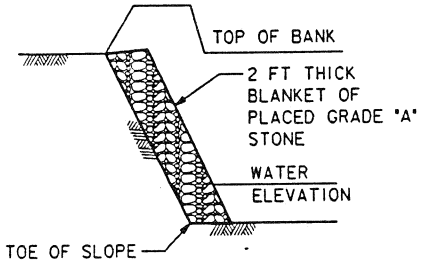
PLAN

SCALE: 1" = 400'



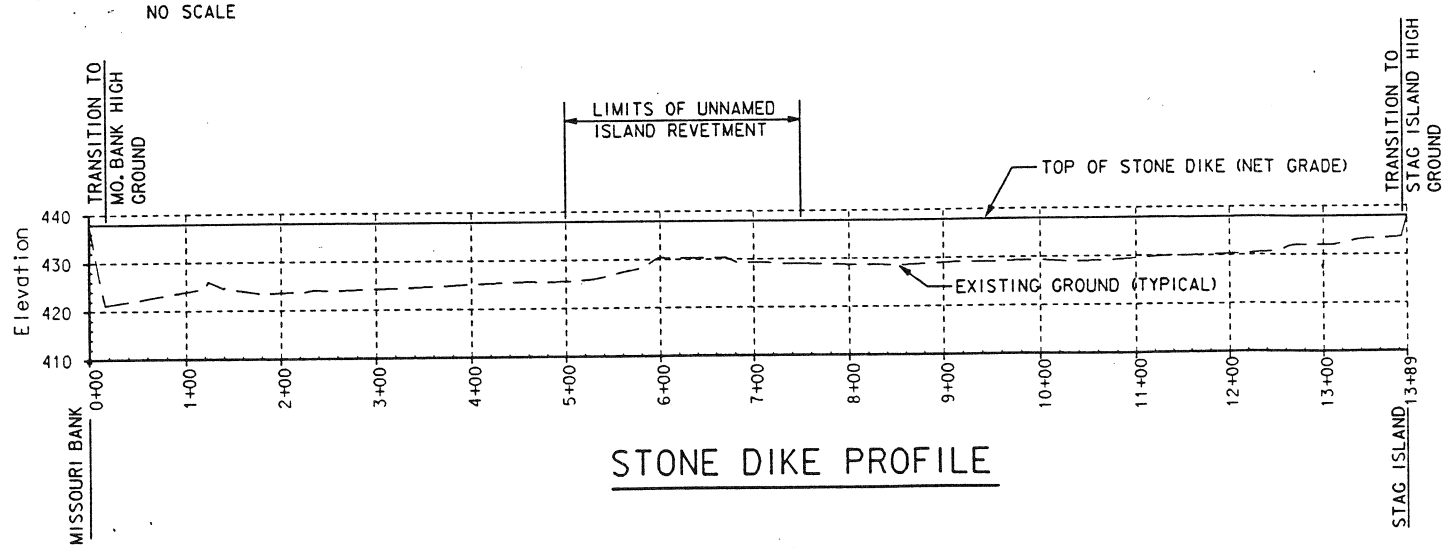
STONE DIKE - TYPICAL SECTION

NO SCALE



SECTION AT REVETMENT

NO SCALE



STONE DIKE PROFILE

NOTES:

1. ORIGINAL HYDROGRAPHIC SURVEY DATA PRODUCED IN 1989, TITLED 'AFTER DREDGE SURVEY'.
2. ADDITIONAL HYDROGRAPHIC SURVEY DATA WAS PRODUCED IN 1996 AND ADDED TO THE SURVEY DATA IN NOTE 1. THIS DATA IS IN THE VICINITY OF THE NORTH ENDS OF STAG ISLAND AND THE UNNAMED ISLAND.

SYMBOL	DESCRIPTION	DATE	APPROVED

REVISIONS

U.S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

DESIGNED BY: T.NIEDERNHOFER
DRAWN BY: J. HELFRICH
CHECKED BY: T.NIEDERNHOFER
DATE: APRIL 1997

UPPER MISSISSIPPI RIVER SYSTEM
POOL 25, LINCOLN COUNTY, MISSOURI
DEFINITE PROJECT REPORT
ENVIRONMENTAL MANAGEMENT PROGRAM
STAG ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

PLAN AND SECTION

SIZE	DWG. CODE	DRAWING NO.
D	DACW 43	FIGURE 6.1

DESIGN FILE: $$$DESIGN&FILE&SPECIFICATION$$$ | PLOT DATE: $$$DATE-TIME$$$$
PLOT SCALE: 400:1 | SOL. NO. DACW43-94-B-X | FILE NO. | SHEET 1 OF 1

"The felling of trees greater than 9 inches diameter at breast height will be scheduled during September through April, which is outside the period May 1 - August 31, when Indiana bats are known to inhabit summer habitat. If for any reason clearing of trees greater than 9 inches diameter at breast height has to be carried out during the period May 1 - August 31, a site visit will be conducted first by a team of biologists to determine if any roost trees are among those proposed to be felled. The team will consist of representatives from the Missouri Department of Conservation, U.S. Fish and Wildlife Service, and St. Louis District. The District will enter into section 7 consultation with the U. S. Fish and Wildlife Service if removal of a roost tree during the period May 1-August 31 is proposed."

(2) **Permits.** The only permits or certifications necessary relate to the Clean Water Act. Section 401 water quality certification has been received from the state; see Appendix DPR-C for associated documentation. Section 404 approval for the project has been requested from the Regulatory Branch, St. Louis District Corps of Engineers.

d. Operation, Maintenance, and Rehabilitation. The responsibilities of the project sponsor, MDOC, for the Operation, Maintenance and Rehabilitation of the project are described below.

(1) **Operation.** The Stag Island HREP shall be operated by the sponsor, MDOC. The sponsor may use the project for the production of crops to provide food for wildlife, as permitted by current agreements regarding General Plan Lands. The sponsor shall not collect any fees other than the state hunting and fishing game license and the state waterfowl blind draw fees. No fees may be charged for the ingress and egress of the project area for the purpose of hunting and fishing.

(2) **Maintenance and Rehabilitation.** After completion of the project, MDOC will be responsible for maintaining the dike. Maintenance is defined as repair and replacement associated with hydrologic events that do not exceed the level of design for the project. For Stag Island, this level of design has been designated as the top elevation of the dike structure (438 NGVD).

Rather than repairing low spots which develop in the dike due to long term post-construction settlement, the district has opted (due to the EMP program nearing its completion) to place additional stone at the outset to compensate for any anticipated settlement of the dike. All other routine dike maintenance (including some rock material repair, dike inspection, and litter removal) is the responsibility of the sponsor.

e. Project Performance Evaluation Monitoring Plan. Plans have been developed to monitor this project for performance evaluation purposes. This monitoring will measure the degree of attainment of the project objectives. Therefore, for each objective, an appropriate monitoring variable was specified. The specific variable to be measured for each objective is shown in Table K-2 (see Appendix K). Field monitoring methods will be standardized as much as possible, to match those methods used for other HREP projects, and to match those used in the Long Term Resource Monitoring program. Costs associated with the monitoring are shown in Table K-3.

f. Real Estate Requirements. The project consists of construction of an emergent rock dike, situated in order to protect and maintain a deep water, off-channel, slack water area in the side channel between Stag Island and the Missouri shore.

(1) **Project Lands.** Government-owned properties designated as General Plan lands will be used for the project. These lands are located on the Missouri side of the Mississippi River in Pool 25 between river miles 247.7 and 249.5. The proposed feature will be designed for development upon these lands and within the navigational servitude of the project waters.

(2) **Real estate requirements.** Potentially, temporary access interests, over state-owned or private lands, may be required for delivery, staging, and placement of rock and revetment materials, as an alternative to delivery by barge. There are no proposed P.L. 91-646 relocations anticipated, considering that no land acquisitions are required. There are no known utility/facility impacts. Additionally, there are no known Hazardous, Toxic, Radioactive Waste concerns (HTRW), or other environmental issues identified for the project.

(3) **Operation and Maintenance.** Following construction, the Missouri Department of Conservation will manage the habitat features pursuant to an Operation, Maintenance and Rehabilitation Agreement to be developed during the construction phase of the project between the U.S. Fish and Wildlife Service and the Department of the Army.

g. Cost Estimates.

(1) **Construction.** An estimate of the initial construction costs is presented in Table 6.1 (base year dollars) and Table 6.2 (fully funded dollars). A more detailed breakdown of base year costs is provided in Appendix L. The present estimate was developed using current designs and quantity take-offs, recent bid abstracts for projects in the area, detailed cost estimates, and estimator judgement. The price level for this estimate is October 1997. The cost estimate was accomplished using the Micro-Computer Aided Cost Engineering System (MCACES). The MCACES estimate details the total construction costs, including labor, materials, and supplies. An appropriate contingency applied to each line item.

(2) **Operation, Maintenance, and Rehabilitation.** No operations or rehabilitation costs are assumed. Maintenance costs are estimated to be $ 7,050 annually (see Table 6.3).

h. Project Completion Schedule. Table 6.4 presents a schedule of project implementation steps and associated dates.

TABLE 6.1

PROJECT COST ESTIMATE SUMMARY

STAG ISLAND
BASE YEAR DOLLARS
(OCTOBER 1997 PRICE LEVELS)

Cost Account Number	Description of Item	Estimated Cost
06._._._	Fish and Wildlife Facilities	$ 334,500.00
30._._._	Planning, Engineering, and Design	$ 317,200.00
31._._._	Construction Management	$ 47,800.00
	Subtotal	$ 699,500.00
	Contingencies	$121,800.00
	TOTAL PROJECT COST	$ 821,300.00

NOTE: Subtotal includes home and field office overhead, profit, bond.

TABLE 6.2

STAG ISLAND PROJECT COST ESTIMATE -- FULLY FUNDED DOLLARS

Cost Category		Total Study Costs			
		All Years	Thru FY 97	FY 98	FY 99
Base Year Dollars*	HL	391,000	153,000	97,000	141,000
	O	430,000	0	0	430,000
	Total	821,000	153,000	97,000	571,000
Inflation Factors 1/	HL	--	0	1.047	1.088
	O	--	0	1.026	1.040
Fully Funded Estimate	HL	409,000	153,000	102,000	154,000
	0	447,000	0	0	447,000
	Total	856,000	153,000	102,000	601,000
Federal Cost Share	HL	409,000	153,000	102,000	154,000
	O	447,000	0	0	447,000
	Total	856,000	153,000	102,000	601,000
Local Cost Share	HL	0	0	0	0
	O	0	0	0	0
	Total	0	0	0	0

HL = Hired Labor Costs
O = Other Costs

1/ Inflation Factors as of April 1997
* Base Year Dollars as of October 1997 price level

TABLE 6.3

STAG ISLAND ESTIMATE OF ANNUAL OPERATION, MAINTENANCE,
AND REHABILITATION COSTS
OCTOBER 1997 PRICE LEVELS

Item	Interval			Unit Price ($)	Total Price ($)	Average Annual Price ($)
	Years	Quantity	Unit			
OPERATIONS:						
None						
MAINTENANCE:						
Dike Inspection and Reporting	Annual	20	Hr	20	400	400
Fish and Wildlife Management	Annual	Sum	Job	--	2,000	2,000
Dike Maintenance (Grade "A" Stone)	1 in 5	4,000	Tons	7	28,000	4,650
				TOTAL - MAINTENANCE		7,050

Note

1. Maintenance costs are defined as those costs of repair and replacement associated with events (including minor storm and flood events) that do not exceed the level of design for the project. For example, at Stag Island this level of design has been designated as the top elevation of the dike structure. In the project reach, river stages would remain at or below the top of the dike about 95 percent of the time. On this basis, at least some rock material is expected to be lost during minor flood events and from ice damages.

2. Consistent with other UMPS-EMP projects, no estimates of rehabilitation cost are provided in this table. Any costs presented would be based on so little historical data as to be highly unreliable and misleading. Any mutually agreed rehabilitation work would be cost shared (75 percent Federal, 25 percent non-Federal). Rehabilitation is here defined as reconstruction work needed in excess of estimated annual O&M, as a result of specific storm or flood events. For the Stag Island project, elevations above 438 NGVD occur less than 5 percent of the time. Any damage to the dike is expected from currents overtopping the structure during this time period.

3. Annulization based on an 8.0 percent interest rate, and a 50-year project life.

TABLE 6.4

PROJECT IMPLEMENTATION SCHEDULE

Requirements	Scheduled Date[1]
Submission of Draft Definite Project Report to Technical Review Team	Apr 1997
Submission of DPR to Corps of Engineers, Mississippi Valley Division, agencies, and public for review	Jul 1997
Submit final DPR to Mississippi Valley Division	Mar 1998
Initiate plans and specifications	Apr 1998
Advertise for bids on contract	Jun 1998
Complete construction	Feb 2000

7. ENVIRONMENTAL EFFECTS OF THE SELECTED PLAN

An environmental assessment has been conducted for the proposed action, and a discussion of the probable impacts follows. The categories of impacts listed in the environmental impacts matrix (Table 7.1) were reviewed and considered as part of the environmental assessment.

a. Physical Resource Effects. The proposed 1,300 foot long emergent dike represents the main topographic change to the project area. The dike's crown will extend to 438 feet NGVD, or four feet above normal pool (434 feet NGVD), which corresponds to less than a 5-year frequency flood elevation (Table 3.2). By closing off the side channel and upper chute, the dike will divert almost all flows currently passing down through the side channel and upper chute toward the main channel east of the Stag Island complex. Over time, localized scour holes will develop immediately downstream of the emergent dike. Sedimentation will continue in off-channel areas not protected by the proposed dike, and the conversion of main channel border and lower chute aquatic habitats to terrestrial habitats is expected in the immediate vicinity of Keeton Island. Over the project life this loss of aquatic habitat is expected to be about 20 acres. Relatively small areas of sediment deposition are also expected to develop immediately upstream of the proposed emergent dike, especially along the bank.

Based on historic gage records for the project area, water levels are expected to overtop the proposed dike about 6 percent of the time on an average annual basis, which is equivalent to about 22 days per year (see Table 3.1 in the main report and Figure I-7 in Appendix I). Conversely, water levels are not expected to overtop the dike for 94 percent of an average year. Overtopping events can occur from February through December, and on an average monthly basis they happen at least 5 percent of the time from March through July. Overtopping events are expected most often during April and May; on an average monthly basis, they are expected 21 and 19 percent of the time, respectively, or 6.3 and 5.9 days for these two months.

b. Natural Resource Effects. Habitat benefits generated by the selected plan, as well as all other alternatives, were quantified using three methods: one for riverine fish, one for diving ducks, and one for wetland wildlife inhabiting nonforested and forested habitats. These methods and results are described in detail in Appendix I. Habitat conditions for fish were assessed using four target species as the focus of management efforts (white bass, emerald shiner, smallmouth buffalo, bluegill). The white bass and emerald shiner represent two guilds of fishes (large and small) that prefer aquatic habitat with current. The smallmouth buffalo and bluegill represent two additional guilds (large and small) that prefer aquatic habitats with little or no flow. Habitat conditions for diving ducks, a separate target group, were assessed in terms of diving ducks in general (i.e., not species specific). Evaluations for fish and diving ducks focused on the aquatic habitats, including side channel, chute, island slough, and main channel border. The evaluation for wetland wildlife was made for 12 evaluation species (ten birds, two mammals), none of which were judged a target species. This evaluation focused on terrestrial habitats, and included island sloughs and forests. The ten birds include the mallard, wood duck, Canada goose, and

Table 7.1. Magnitude of Probable Environmental Impacts Associated with Implementation of Recommended Plan (1,300-foot long Emergent Stone Dike with 438 feet NGVD Crown Elevation) at Stag Island.

PARAMETER	INCREASING BENEFICIAL IMPACT <------			NO APPRECIABLE EFFECT	INCREASING ADVERSE IMPACT ------>		
	MAJOR	MODERATE	MINOR		MINOR	MODERATE	MAJOR
SOCIAL EFFECTS							
Noise Levels					X		
Aesthetic Values					X		
Recreational Opportunities			X				
Public Health and Safety				X			
Transportation				X			
Community Cohesion				X			
Community Growth and Development				X			
Business and Home Relocations				X			
Existing/Potential Land Use				X			
Controversy				X			
ECONOMIC EFFECTS							
Property Values				X			
Tax Revenues				X			
Public Facilities and Services				X			
Regional Growth				X			
Employment				X			
Business Activity				X			
Farmland/Food Supply				X			
Commercial Navigation				X			
Energy Needs and Resources				X			
Flooding				X			
NATURAL RESOURCE EFFECTS							
Air Quality					X		
Terrestrial Habitat		X					
Wetlands		x					
Aquatic Habitat	X						
Habitat Diversity and Interspersion		X					
Biological Productivity		X					
Quality of Surface Water				X			
Water Supply				X			
Groundwater				X			
Soils				X			
Threatened or Endangered Species				X			
CULTURAL RESOURCE EFFECTS							
Prehistoric/Historic Architectural/Archaeological Values				X			

American coot (all represent the waterfowl group, although the coot is a duck-like swimming member of the crane group); lesser yellowlegs (shorebirds group); king rail (cranes and allies group); least bittern and green-backed heron (herons and egrets group); and northern parula and prothonotary warbler (songbirds group, more specifically Neotropical migrants). Mammal evaluation species include the muskrat and beaver. The effect of the recommended plan on the evaluation species/groups is summarized below.

(1) **Fish.** The alteration of flow patterns imposed by the proposed dike will create about 127 acres of slackwater habitat from the 99-acre side channel and 28-acre upper chute. Substantial habitat benefits are expected to accrue to all four target species and to species within the fish guilds that they represent. Reduced sedimentation in the side channel will improve water clarity, reduce turbidity, increase water temperatures, and allow submergent aquatic vegetation to become established. Most trees that naturally fall from the riverbanks along the side channel and upper chute are expected to remain in place rather than be carried downriver, resulting in a net accumulation of woody debris in the backwater area over time that will serve as habitat structure. These changes will improve food production and escape cover.

Fishes that are expected to spawn in this backwater habitat include such species as all members of the sunfish family (including bluegill, largemouth bass, white and black crappie) and gizzard shad. Slackwater conditions are expected during the bluegill spawning season (which peaks in late May and June) on average about nine out of every ten years. Dissolved oxygen levels in the slackwater area during the summer are not expected to reach low levels that could stress fish because fresh water will enter the area from two sources. First, the narrow slough immediately west of the side channel will not be closed off by the proposed dike, and flow from it will continue to enter the slackwater area downstream of the dike. Second, the emergent dike will be constructed of pervious materials, and some flow will seep through the structure into the slackwater area. Because the lower end of the side channel will not be closed off from the river, the newly-created backwater will become important overwintering habitat for many species of fish, including young-of-the-year and adult life stages. The eventual formation of scour holes behind the dike will also increase aquatic habitat diversity for fishes.

(2) **Diving Ducks.** The slackwater area is also expected to serve as migratory habitat for diving ducks by providing suitable slackwater conditions for resting and feeding. Feeding habitat is expected to develop with the establishment of some submergent vegetation and associated invertebrate communities. Other waterfowl such as dabbling ducks that normally use the adjacent B. K. Leach Memorial Conservation Area may also use the slackwater area as loafing habitat.

(3) **Other Wildlife.** The proposed emergent dike will also provide some benefits to wildlife using slough habitats on the 75-acre Stag Island, but they are not that extensive. The dike will retard the sedimentation rate within the large (3 acres) and small (1 acre) shallow sloughs. Decreased sedimentation will retard the invasion of these sloughs by woody vegetation, such as willows and silver maples, and prolong their value as emergent (moist soil) wetlands to waterfowl and shorebirds. Preservation of these sloughs will also maintain terrestrial/wetland habitat diversity, and will benefit forest wildlife that use these sloughs, such as the wood duck. With a dike,

wildlife using forested habitat would experience some habitat losses over time, due to its prevention of the conversion of sloughs on Stag Island from aquatic (emergent) to terrestrial (woody) habitat.

(4) **Other Effects**. Construction of the emergent dike will require the removal of trees where the structure ties into land, and will affect less than one acre of forested habitat. A rock blanket will cover the tip of both affected islands in order to prevent future erosion of them from overtopping water levels. The recommended alternative is not expected to affect any Federally threatened or endangered species (see Appendix H for the St. Louis District's biological assessment of effects on Federally threatened and endangered species). Waters of the United States affected by the recommended plan include portions of the side channel and upper chute, and less than one acre of forested wetlands where the structure ties into land [see section 404(b)(1) evaluation report in Appendix C]. Water quality certification has been applied for from the state of Missouri. Manipulations of water levels in Pool 25 by the St. Louis District as part of environmental pool management are not expected to be incompatible with the recommended plan's objectives.

c. Federally Endangered Species. The only endangered or threatened species of concern in the Stag Island area is the Indiana bat. Evidence of compliance with the Endangered Species Act is given in Appendix H, which also summarizes the natural history of the Indiana bat. Concerns related to the scheduling of construction, species protection, and habitat preservation are discussed in Section 6 c. above. In addition, the presence of bald eagles in the project area could also affect construction scheduling. They are often seen in the vicinity of Stag Island, and although they are not listed as a threatened or endangered species for Lincoln County, every effort will be made to accommodate and protect bald eagles in the project area.

d. Environmental Quality Effects. Fumes will be generated by water-based heavy equipment during the construction process. Little dust will be generated. The project is not expected to have any long-term adverse effect on the air quality of Lincoln or surrounding Counties.

e. Cultural Resource Effects. Analysis of Archaeological Survey of Missouri and Corps of Engineers site files, maps, and other documents indicate that the project will have no negative effects or adverse impacts on historic properties (see Letter Report in Appendix F for a detailed description of the District's findings). The Missouri State Historic Preservation Officer has concurred with the District's finding of no adverse impact.

f. Socioeconomic Effects. Development in Lincoln County is not expected to be affected by the project. Although local residents may benefit somewhat from improved hunting and fishing in the area, a large scale increase in these activities drawing people from farther away is not expected. The proposed project would have minimal or no impact on the following socioeconomic categories: aesthetic values, transportation, public health and safety, community cohesion, community growth and development, business or business activity, food supply, navigation, flooding effects, or energy sources.

g. Recreation and Aesthetic Effects. Anglers and waterfowl hunters should benefit from the increased numbers of fish and waterfowl that will use the area due to the improved habitat conditions. Hunting within the Stag

Island complex will continue as before, but bird watching will improve as more migratory birds, especially waterfowl, use the backwater area. Short-term opportunities for fishing, hunting and boating may be affected during project construction. Construction of the emergent dike will have minor adverse impacts on the aesthetic quality of the project area during the duration of the work.

h. Cumulative Impacts. About 55 UMPS-EMP Habitat Rehabilitation and Enhancement Projects (HREP) have been or will be implemented in the Upper Mississippi River System within the St. Paul, Rock Island, and St. Louis Districts. They are site-specific and limited in scope. Cumulatively they directly affect less than five percent of the total UMPS area. Post-construction monitoring of completed projects has shown that the majority have met their objectives, while others have fallen short to varying degrees. If all implemented projects were to perform poorly, it would not represent an irreversible, catastrophic adverse impact on the river's ecosystem. The St. Louis District prepared a cumulative impact assessment for the HREP program, and it appeared in the District's final report for the Calhoun Point HREP project (dated September 1995). That assessment does not appear here in this Stag Island report, but is available upon request from the District's Planning Division.

i. Compliance with Environmental Requirements. The proposed project complies fully with applicable Federal environmental laws, Executive Orders, and official Corps guidance publications for the current stage of planning. Among the more pertinent are the Clean Air Act; Clean Water Act; Endangered Species Act of 1973; Farmland Protection Policy Act; Fish and Wildlife Coordination Act; National Environmental Policy Act of 1969; National Historic Preservation Act of 1966; Rivers and Harbors Appropriation Act of 1899; Executive Order 11988 - Floodplain Management; Executive Order 11990 - Protection of Wetlands; and U.S. Army Corps of Engineers Engineer Regulation 1105-2-100, Guidance for Conducting Civil Works Planning Studies (USACE ER 1105-2-100).

j. Adverse Environmental Effects Which Cannot be Avoided. Adverse impacts which cannot be avoided include spot clearing and/or tree removal for construction of the emergent dike.

k. Short-term Uses of Environment Versus Long-term Productivity. Local short-term uses of the environment are limited to disturbances created during the construction process. Such things as soil disturbance, tree removal, and construction of the emergent dike are all short-term uses of the environment. Maintenance and enhancement of long-term biological productivity is the basic goal of this project. Productivity of the old side channel (or newly-created backwater area) will be enhanced once the dike is built and the production of submergent aquatic vegetation and maintenance of fallen woody debris from banklines is possible. The short-term uses of the project area are minor in comparison to the expected increase in biological productivity.

l. Irreversible or Irretrievable Resource Commitments. Should the proposed project be implemented, there will be irreversible or irretrievable resource commitments. These would include initial construction costs (Federal), and maintenance and rehabilitation costs by the Missouri Department of Conservation.

8. COMPARISON BETWEEN DPR SELECTED PLAN AND ORIGINAL CONCEPT PLAN

a. Location. The original fact sheet (see copy on following page) placed the project between river miles 247.8 and 249.4. The defined project area is now considered to be slightly larger: it stretches from mile 249.5 at the upstream end to mile 247.7 at the downstream end. All of the habitat quantification calculations were based on the larger project area.

b. Resource Problem. The original fact sheet states simply and concisely that sedimentation has eliminated or significantly degraded productive off-channel backwater habitats in Pool 25. These facts have not changed.

c. Proposed Project. Originally, two separate emergent dikes were proposed, which totaled about 8100 feet in length. Both would have been built with graded "A" stone, to an elevation 2 feet above normal pool. The selected plan utilizes only one rock dike, built in essentially the same manner, but to an elevation 4 feet above normal pool. The single dike will total about 1300 feet in length, and will have a six foot wide crown.

d. Proposed Outputs. The primary Project Output predicted in the original Fact Sheet was "approximately 400 acres of productive fish spawning, nursery, and off-channel refuge habitat." These habitat enhancements are still to be expected. However, based on the selected plan, a more realistic appraisal of the project indicates it will affect about 130 acres.

e. Financial Data. Originally, construction costs were expected to total $ 2,070,000. Operation and maintenance was expected to cost $ 1,700 annually. The selected plan requires construction of only one feature, and is simpler than the original concept plan. Therefore, construction of the selected plan will cost considerably less than was first estimated. It is estimated that the selected plan will cost $ 553,000 to build (excluding general design costs); annual operation and maintenance costs are estimated to be $ 7,050.

Two related factors were primarily responsible for the difference in cost between the original plan and the selected plan. Program funding constraints at the District level dictated the selection of a low-cost but environmentally efficient project design. Also, there was a clear need for a simple design which would accomplish the habitat enhancement without substantial recurring annual O&M costs.

ORIGINAL FACT SHEET

CELMS-PM-M 11 February 1991

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM
FACT SHEET

STAG ISLAND BACKWATER COMPLEX
POOL 25, MISSOURI

Location: This proposed project is located on the Missouri side of the Mississippi River in Pool 25 between river miles 247.8 to 249.4.

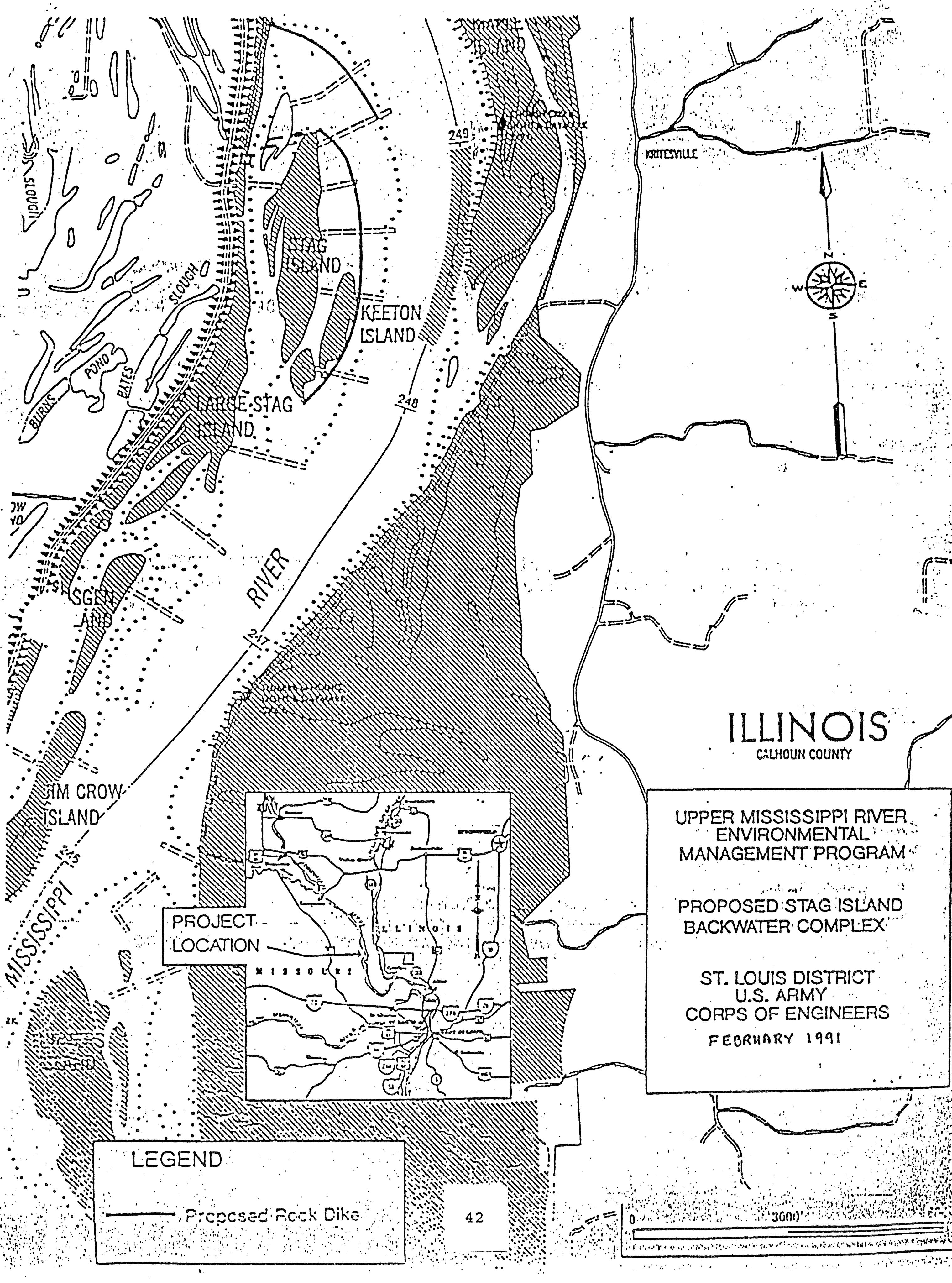
Resource Problem: Sedimentation has eliminated or significantly degraded productive off-channel backwater habitat in Pool 25.

Proposed Project: The proposed project will protect backwater from sedimentation in the Stag and Keeton Island complex. One emergent dike will be constructed from the Missouri shore at river mile 249.5 extending 2500 feet to the end of an existing emergent dike off the north shore of Stag Island. A second emergent dike will extend 5600 feet from the northern end of Stag Island to the southeast and wrap around Keeton Island on the channel side. The dikes will be constructed with graded 'A' stone, 2 feet above normal pool with a 6 foot crown.

Project Outputs: The project will produce approximately 400 acres of productive fish spawning, nursery, and off-channel refuge habitat. The extensive backwater complex would provide important habitat necessary for the successful reintroduction of lake sturgeon in the UMPS and provide forage for the bald eagle.

Financial Data: The project is located on U.S. Army Corps of Engineers General Plan Land. Construction cost would be 100% federal. The Missouri Department of Conservation would assume management responsibility for the completed project. The general design cost is estimated at $ 180,000. Construction cost is estimated at $ 2,070,000. Annual operation and maintenance costs are estimated at $ 1,700.

Status: Project approval requested.



SLOUGH
SLOUGH
BURYS
POND
BATES
STAG ISLAND
KEETON ISLAND
LARGE STAG ISLAND
249
248
247
RIVER
MISSISSIPPI
JIM CROW ISLAND
KRITESVILLE
N
E
W
S
ILLINOIS
CALHOUN COUNTY
UPPER MISSISSIPPI RIVER ENVIRONMENTAL MANAGEMENT PROGRAM
PROPOSED STAG ISLAND BACKWATER COMPLEX
ST. LOUIS DISTRICT U.S. ARMY CORPS OF ENGINEERS
FEBRUARY 1991
PROJECT LOCATION
ILLINOIS
MISSOURI
LEGEND
Proposed Rock Dike
0
3000

REVISED FACT SHEET

CELMS-PM-M

21 April 1997

UPPER MISSISSIPPI RIVER SYSTEM ENVIRONMENTAL MANAGEMENT PROGRAM
FACT SHEET

STAG ISLAND BACKWATER COMPLEX
POOL 25, MISSOURI

Location: This proposed project is located in Lincoln County, Missouri, in the lower quarter of Pool 25 of the Mississippi River, between river miles 249.5 to 247.7. The 486-acre project area consists of a complex of four islands and surrounding off-channel aquatic habitats located on the inside bend of the river. The four islands are mainly forested and lie low with respect to the river. Aquatic areas include main channel border, side channel, chute, main channel, and island slough habitats.

Resource Problem: Sedimentation has eliminated or significantly degraded productive off-channel backwater habitats in Pool 25, especially backwaters, which serve as valuable spawning, rearing, and overwintering areas for riverine fish. Suitable slackwater habitat for migratory waterfowl, especially diving ducks, is also in short supply. Aquatic habitats within the study area have little structure. Sediment "plugs" that have formed over time in the opening of two sloughs on Stag Island prevent optimal moist soil plant production in these areas in conjunction with Pool 25 water level manipulations for habitat improvement.

Proposed Project: The proposed project is the construction of a 1,300-foot long emergent stone dike extending from the Missouri shoreline to the tip of Stag Island. This dike would cross the upper end of the side channel and upper chute. It would have a crown elevation of 438 feet NGVD, or four feet above normal pool (434 feet NGVD).

Project Outputs: The project will create about 127 acres of slackwater habitat from the 99-acre side channel and 28-acre upper chute. The dike is expected to reduce sediment and turbidity, improve water clarity, and allow the accumulation of woody debris and establishment of some submergent aquatic vegetation in the protected area. This slackwater area is expected to serve as spawning, rearing, and overwintering habitat for many riverine fishes, and as resting and feeding habitat for migrating diving ducks. The dike is expected to retard the accumulation of sediments in sloughs on Stag Island, and delay the encroachment of woody vegetation in these productive units.

Financial Data: The project is located on U.S. Army Corps of Engineers General Plan Lands. Construction cost would be 100 percent federal. The Missouri Department of Conservation would assume 100 percent of the O&M costs and management responsibilities for the completed project. The general design cost is estimated at $ 180,000. Construction cost is estimated at $ 676,000. Annual operation and maintenance costs are estimated at $ 7,050.

Status: The draft Definite Project Report (DPR) was released July 1997 for public and agency review.

9. IMPLEMENTATION RESPONSIBILITIES

a. U.S. Army Corps of Engineers. The St. Louis District of the Corps of Engineers is responsible for stewardship management at Stag Island. The District is also responsible for the preparation and submission of the DPR; programs funds; finalizes the Plans and Specifications; completes all National Environmental Policy Act requirements; advertises and awards a construction contract; and performs construction contract supervision and administration.

b. U.S. Fish and Wildlife Service. The USFWS is responsible for fish and wildlife planning coordination and review of the District's endangered species determination. The planning coordination includes consideration of problem identification, the evaluation of planning assumptions, and review and comment on the selected plan. Generally, the Ecological Services Suboffice in Marion, Illinois, concurs with the planned project features, and indicates that the project will have no effect on Federally listed threatened or endangered species in its Draft Fish and Wildlife Coordination Act report.

The views of the USFWS on implementation responsibilities are contained in the Fourth Annual Addendum, III.A.1 page 9. In the future, the USFWS will ensure that O&M activities are conducted in a manner compatible with refuge objectives and management strategies, and will ensure that the O&M is performed in accordance with Section 906 (e) of the Water Resources Development Act of 1986 and the Operation, Maintenance, and Rehabilitation Agreement.

c. Missouri Department of Natural Resources. MDOC has participated in the identification and definition of problems, needs, opportunities, measures, plans, and monitoring at the Stag Island HREP site. MDOC is prepared to serve as the non-Federal sponsor of the project, and will conduct O&M activities, as described in the DPR, and any mutually agreed upon rehabilitation, which would be accomplished in accordance with the Water Resources Development Act. In addition, the Department will provide field observations for the project site (via the annual management report for Cooperative Agreement Lands) for the project's performance evaluation monitoring.

10. COORDINATION, PUBLIC VIEWS, AND COMMENTS

The agencies (federal, state and local), organizations and individuals receiving the Definite Project Report and Environmental Assessment are listed in Appendix DPR-D.

Numerous joint field reconnaissance trips and study meetings were conducted by representatives of the St. Louis District, USFWS, and MDOC. Representation from the USFWS included refuge, ecological services, fisheries assistance, and Environmental Management Technical Center personnel. Representation from MDOC included personnel from the land management, planning and fisheries divisions.

Additionally, coordination will be carried out as a result of public and agency review of the Draft DPR/Environmental Assessment/Draft Finding of No Significant Impact. During the 30-day public review period, a public workshop will be held. The general public will be notified via news releases, and public notices sent via mail and postings at key public facilities. At the workshop, planning team members and the project sponsors will be in attendance to discuss the project. The study manager will provide an overview of the project, and graphic displays will further enhance the public's understanding of the proposed project. Questions from the public will be answered.

The St. Louis District's responses to the Draft DPR review comments ~~will~~ are ~~be~~ provided as Appendix DPR-B to the final report, and a brief summary of the comments and responses ~~will be~~ are included in the final report as well. The USFWS has provided comments in a letter (see Appendix DPR-G) which constitutes its final Fish and Wildlife Coordination Act Report as compliance with Subsection 2(b) of the Fish and Wildlife Coordination Act, and Section 7 consultation requirements of the Endangered Species Act of 1973, as amended. The Service concurs with the Appendix DPR-H (biological assessment) that the project will have no effect on Federally listed threatened or endangered species.

11. CONCLUSIONS

Sedimentation has eliminated or significantly degraded productive off-channel habitats in Pool 25. Backwaters which serve as valuable spawning, rearing, and overwintering areas for fish, and slackwater areas for migratory waterfowl have been degraded or eliminated, especially in the lower reaches of the river pools.

At Stag Island, there is an opportunity to protect and maintain a deep-water off-channel area. For this reason, Stag Island has been recommended for priority inclusion in the UMPS-EMP by the Missouri Department of Conservation and the U.S. Fish and Wildlife Service. Both agencies support the efforts of the Corps of Engineers, St. Louis District, in the design and construction of the Stag Island HREP.

The proposed project is of simple design and consists of a single 1,300 foot long rock dike built to four feet above normal pool. A rock dike of this design will be overtopped only 6 percent of the time and will thus stop about 94 percent of the sediments from reaching the protected area behind the dike. This sediment reduction would enhance both the longevity and productivity of the Stag-Keeton complex as fish and wildlife habitat. The slackwater area, and protected shallows will enable a greater productivity and availability of plant and invertebrate food sources for migrating ducks. Cover for fish will increase naturally, as tree falls and driftwood are allowed to accumulate in the shallows and along the banks.

12. RECOMMENDATIONS

I have weighed the accomplishments to be obtained by implementing this Habitat Rehabilitation and Enhancement Project versus the costs, and have also considered the scope and the special locational factors associated with the project. In my judgment, implementing the proposed project would entail a justified expenditure of Federal funds.

I recommend that the Secretary of the Army, under the provisions of Public Law 99-662, approve this project for habitat rehabilitation and enhancement at Stag Island in Lincoln County, Missouri. The Missouri Department of Conservation has furnished a Letter of Intent. The total estimated fully funded cost of this project is $856,000. Of this amount, I request that $137,000 be allocated so that Plans and Specifications phase work can be initiated as soon as possible.

Thomas J. Hodgini
Colonel, U.S. Army
District Engineer

13. LITERATURE CITED

This section lists all references cited in the main report as well as in all appendices.

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14. LIST OF PREPARERS AND REVIEWERS

The Corps staff members primarily responsible for preparing sections of this document are listed in Table 14.1, below. Those who served as internal Technical reviewers of the DPR are listed in Table 14.2. Other state or Federal agency personnel who were involved in the selection and design of the project are listed in Table 14.3.

TABLE 14.1

STAG ISLAND
DEFINITE PROJECT REPORT / ENVIRONMENTAL ASSESSMENT PREPARERS

Name	Study Role	Expertise / Experience
James Carucci	Archeologist; DPR Report Preparation	10 yrs CRM and University Archeologist; 3 yrs District Archeologist, SLD
Patti Fisher	Geodesy; Cartography	10 yrs Cartographer; 2 yrs Cartographer SLD
Tim George	Ecologist; EA Discussions DPR Report Preparation	16 yrs Wildlife Biology/Ecology, SLD
Harry Hamell	Real Estate Specialist	12 yrs Real Estate Appraisal, SLD
Matt Hunn	Geotech - Foundations	2 yrs Dam Safety Instrumentation and Evaluation; 4 yrs Geotechnical Design, SLD
Nancy Hsieh	Hydrology/Hydraulics Design	7 yrs MO State Highway Department; 27 yrs Hydrology/Hydraulics, SLD
John Naeger	Potamology	10 yrs Structural Section; 11 yrs CADD Manager; 5 yrs Potamology Section, SLD
Tom Niedernhofer	Project Technical Manager	3 yrs civil design; 1 yr project management, SLD; 9 yrs structural design, SLD
Mike Ricketts	Regulatory Project Manager	2 yrs Soil Scientist, NRCS; 3 yrs Regulatory Branch, SLD
Toni Serena	Structural Design	2 yrs Structural Design, Private; 3 mos Civil Design, NOD; 14 yrs Structural Design, SLD
Mike Thompson	Project Management	10 yrs Construction Management, General Contractor (SLD); 1 yr Project Management, SLD
Genie Wachter	Hazardous Waste Assessment	12 yrs Civil/Environmental Engineer, SLD
Bob Wasitis	Construction	5 yrs Mel Price Locks and Dam, SLD; 5 yrs Quality Assurance, SLD
Jennifer Watkins	Incremental Cost Analysis	5 yrs Real Estate Appraiser, SLD; 4 yrs Economics, SLD
Larry Wernle	Study Manager	9 yrs Construction Management, SLD; 2 yrs Project Management, SLD; 2 yrs Study Management, SLD
Cathy Zajchowski	MCACES Cost Estimate	5 yrs MO State Highway Department; 8 yrs Cost Engineering, SLD

TABLE 14.2

STAG ISLAND
DEFINITE PROJECT REPORT / ENVIRONMENTAL ASSESSMENT TECHNICAL REVIEW TEAM

Name	Technical Review Area	Expertise / Experience
Tamara Atchley	Structural Design	13 yrs Structural Design, SLD
Steele Beller	Real Estate Specialist	10 yrs Real Estate, Private; 7 yrs Real Estate, State of Mo.; 8 yrs Real Estate, SLD
Michael Brazier	Regulatory	23 yrs Engineering Div., Design Branch; 5 yrs Regulatory, SLD
Sharon Cotner	Project Management	9 yrs Study Management, SLD; 8 yrs Project Management, SLD
Bruce Douglas	Construction	1 yr Highway Construction, State of MO; 22 yrs Construction Management, SLD
Gary Dyhouse	Hydrology/Hydraulics Design	26 yrs Hydrology/Hydraulics; 29 yrs SLD
Ron Frerker	Hazardous Waste Assessment	20 yrs Science Teaching; 2 yrs Water Quality, SLD
Dave Gates	Technical Review Team Leader	10 yrs Wildlife Biology, SLD; 8 yrs Study Management, SLD
Suzanne Harris	Archeologist	26 yrs Archeologist, 12 yrs SLD
Larry Kilgo	Economics; Cost Analysis	18 yrs Economics
Gary Lee	Civil Engineering/Design - Technical Review of DPR	5 yrs Construction Management, SLD; 2 yrs Regulatory, SLD; 2 yrs Facilities Engineering, SLD; 6 yrs Civil/Structural Design, SLD
Bob Mesko	Geodesy; Cartography	30 yrs Mapping/Surveying, SLD
T. Miller	Biologist	15 yrs Fisheries Biologist; 15 yrs Wildlife Biologist
Dawayne Sanders	Cost Engineering	10 yrs Cost Engineer, SLD
Joe Schwenk	Geotech - Foundations	19 yrs Geotechnical Engineering, SLD
Claude Strauser	Potamology	27 yrs River Engineering, SLD

TABLE 14.3

STAG ISLAND
DEFINITE PROJECT REPORT
AGENCY CONTRIBUTORS

Name	Agency	Role / Expertise
Ross Adams	US Fish and Wildlife Service Quincy, IL	Wildlife Biologist
Ken Brummett	Missouri Department of Conservation Hannibal, MO	Fisheries Biologist
Joyce Collins	US Fish and Wildlife Service Marion, IL	Wildlife Biologist
Ken Dalrymple	Missouri Department of Conservation Elsberry, MO	Wildlife Biologist; Forester
Gordon Farabee	Missouri Department of Conservation Jefferson City, MO	Fisheries Biologist
Norm Stucky	Missouri Department of Conservation Jefferson City, MO	Environmental Coordinator

15. Quality Control and Technical Review

The Corps has discontinued technical review of reports at the Division level, and has transferred that function to the District level. Review for policy compliance remains with Headquarters, U.S. Army Corps of Engineers for EMP studies over two million dollars. For projects under 2 million dollars, this authority has been delegated to the Division level. Policy review for the Stag Island project will be conducted at the Division level.

In the St. Louis District, a formal quality control / quality assurance process has been developed. The quality control process involves a separate and independent technical review team conducting concurrent review of the reports. Table 15.1 is a summary of tasks conducted and issues addressed in the quality control process for this DPR.

Table 15.1

Quality Control Procedure Checklist.

Task / issue	Completed, or N/A
GENERAL	
Authority a. Conformity with study authority?	YES
Scope of Investigation a. Problems adequately addressed?	YES
Objective of Investigation a. Planning objectives clearly stated?	YES
Risk-based Analysis	N/A
Cost Effectiveness and Incremental Cost Analyses	YES
Project Cost Sharing a. Is the apportionment of cost to local interests in conformance with present policy and evaluation procedure?	YES
b. If recreation or fish and wildlife enhancement are included in multiple-purpose projects, is a letter of intent from non-Federal interests included?	YES
Coordination a. State/local/Federal coordination adequate, views considered?	YES
b. Conforms with laws, orders, and agency agreements?	YES

c. Preservation/conservation/historical/ scientific interests consulted, views considered? YES

Public Involvement

a. Was adequate public involvement conducted during the planning process to fully inform interested parties and to ascertain their views? YES

b. Have implications associated with the recommended plan been properly addressed? YES

c. Has there been adequate response to public concerns? YES

d. Has the public involvement process been documented, and a discussion of the process prepared? YES

Policy Aspects

a. Conforms with applicable policies? YES

b. Consideration of Administration policies/ decisions? YES

Legal/Institutional

a. Does the draft project memorandums of agreement reflect applicable cost sharing and financing policies; policies regarding evaluation of in-kind non-Federal contributions; and other provisions required by law and policy for new start construction projects? YES

b. Has the sponsor either demonstrated that it possesses all authorities necessary to implement its responsibilities under the PCA or submitted a plan to obtain those authorities? YES

PLAN FORMULATION

Scoping

a. Have all reasonable alternatives, including non-structural and no-action plans, been adequately addressed? YES

b. Has recent guidance been incorporated in the study? YES

c. Has full consideration been given to inclusion of recreation as a project purpose? YES

Existing Conditions/Plan Development

a. Have the assumptions and rationale for the without-project conditions been explicitly stated and are they reasonable? YES

b. Have innovative alternatives been fully considered? YES

Alternative Screening

a. Have both beneficial and adverse effects been adequately evaluated for the selected plan and alternatives? YES

b. Has acquisition of necessary land for future project elements been adequately considered? YES

c. Has a reasonable justification been provided for eliminating alternatives? YES

Plan Selection

a. Are the reasons for selection of major elements of the recommended plan sound and adequate? YES

b. Does the selected plan conform with existing policy? If not, have the reasons for departure been adequately documented? YES

c. Is the selected plan consistent with applicable comprehensive plans for the area? YES

Report Review

a. Consistency with recent guidance? YES

b. Major tech review issues/resolutions documented? YES

c. Tech review certification signature page included? YES

ECONOMIC AND SOCIAL ANALYSIS

a. Are assumptions regarding future alternative conditions clearly stated and justified, and are these assumptions reasonable? YES

b. Have methodologies and assumptions been explained in sufficient detail? YES

c. Is the without-project condition reasonable and does it actually reflect how non-Federal interests will act if the resource under study is not developed? YES

ENVIRONMENTAL ANALYSIS

General	
a. Adequate coordination conducted between Envir., Engineering, and Real Estate?	YES
NEPA and Related Documents	
a. Future benefits assessed by habitat evaluation methodology?	YES
b. Coordination conducted with USFWS?	YES
c. Appropriate envir. appendices included?	YES
d. Monitoring plan prepared?	YES
e. Draft document submitted for LMS review, and revisions made?	YES
HTRW	N/A
Mitigation	N/A
Cultural Resources	
a. Have significant cultural resources been identified and evaluated?	YES
b. Have the necessary cultural resource studies been conducted in accordance with the National Historic Preservation Act and other applicable cultural resources laws and regulations?	YES
Recreation/Aesthetic	~~N/A~~ Yes

ENGINEERING DIVISION

General	
a. Adequate field investigations were conducted?	YES
b. Is project operable?	YES
c. Are annual OM&R costs reasonable?	YES
d. Adequate coordination conducted between Envir., Engineering, and Real Estate?	YES

TABLE 15.2. MAJOR ISSUES OR COMMENTS FROM THE IN-HOUSE TECHNICAL REVIEW.

Issue/Comment	IPT Action Taken
REPORT FORMAT:	
Need to expand list of preparers and reviewers to more fully depict TRT members and their expertise.	Concur; the list was expanded.
A checklist certification sheet is needed as part of quality control and technical review process.	Concur; a checklist certification sheet has been included.
A certification of legal review should be included in the report.	Concur; a legal review certification sheet has been included.
A draft USFWS refuge compatibility study needs to be included in DPR Appendix G.	Concur; a refuge compatibility statement has been included.
A joint EA/Regulatory Permits Public Notice needs to be prepared.	The report is being transmitted to the public via a joint notice.
ENVIRONMENTAL PLANNING:	
More detail needed in Sec 2 of DPR regarding relationship of Stag Island to the General Plan lands and the cooperative agreements with the USFWS and MDOC.	Concur; discussion in the DPR was expanded per subject comment.
Section 5.c. should be rewritten to better indicate why pool water level manipulation does not directly address the Stag Island project objectives.	Concur; section 5.c was rewritten per subject comment.

Issue/Comment	IPT Action Taken
ENVIRONMENTAL PLANNING (CONTINUED):	
Under the "Construction Considerations" section, the bald eagle should be addressed even though it was not officially listed for this area by the USFWS.	Concur; the bald eagle is now addressed in the text of the main report.
Further clarification is needed on what is meant by the Appendix I statement that the AHAG has not yet been field verified.	Concur; clarification of this statement has added to the discussion in Appendix I.
Under the Appendix I "AHAG evaluation species" section the northern pike is included as an evaluation species for the project. Use of the northern pike should have an explanatory foot-note, since it is not well documented for Pool 25. It is being used as a representative of guild 3 and is not a representative fish species expected to occur in Pool 25, either before or after project completion.	After further discussion with the concerned reviewer, this comment has been retracted.
DESIGN/COSTS:	
Design drawings need additional work. In addition to a typical section, a longitudinal profile of the proposed dike structure is also needed. The Figure 6.1 dike structure should be depicted in a more pronounced fashion, and the extraneous hydrographic detail should be removed.	Concur; requested changes have been incorporated into the design drawing.

Issue/Comment	IPT Action Taken
DESIGN/COSTS (CONTINUED):	
The report indicates that stone lost to settlement will be replaced a number of years after initial project construction (i.e., year 2007). Funding for the project expires in the year 2002, not 2007. As an alternative approach, the structure could be constructed slightly higher (at the outset) to compensate for the anticipated settlement.	Concur; the construction of the stone dike has been modified. Additional stone will be used at the outset to compensate for any anticipated settlement of the dike. The final MCACES cost estimate accounts for this change in construction method. The design drawing has been adjusted to reflect a construction grade and a minimum net grade elevation for the structure.
Need to include 30 and 31 account information into the MCACES cost estimate.	Concur; these accounts are now included.
HYDROLOGY/HYDRAULICS:	
Basis for the statement (Sec. 3C of Main Report and Sec. 3 of Appendix E) "Deposition occurs at all times, but is most severe during floods" needs to be clarified. Need to indicate that you would expect at least some scouring during floods, but that in net over the long-term, the process is a "net" depositional process.	Concur; the wording of the section in question has been revised.
Chlorophyll should be added as a laboratory parameter in Appendix K, Table K-1.	Concur; chlorophyll has been added as a water quality parameter.

Issue/Comment	IPT Action Taken
ECONOMICS:	
In the incremental analysis, the dredging of the sloughs was not found to be a cost-efficient measure. However, since the no action plan would reduce future habitat units due to sedimentation, wouldn't this measure actually provide some future benefits?	Concur in part; while slough dredging would provide some future benefits, the magnitude of such benefits would not come close to justifying implementation of these measures.
GEOTECHNICAL:	
The report states that revetments and rock armoring may be required at the head of Stag Island at the Missouri bankline, and at the head of the unnamed island between the shoreline and Stag Island. Do the estimated quantities include the additional stone required for this rock protection?	The estimated quantities do not include the cost of the revetments for the island and the bankline. The rock needed (approximately 8,000 tons) has been included in the final MCACES cost estimate.
Removing the existing timber dikes is costly and creates an unnecessary disturbance. Should consider simply incorporating the dikes into the rock structure.	Concur; removal of the timber dikes would add cost. However, the submerged and buried dikes would only be removed if it was determined that they would interfere with the foundation of the proposed emergent rock dike. Current plans for placement of the rock dike indicate this will not be a problem. The condition of the older timber dikes will be further evaluated during construction.

CHECKLIST CERTIFICATION SHEET

I certify that the Definite Project Report for the Stag Island Habitat Rehabilitation and Enhancement Project has been reviewed and that sound technical practices and procedures have been followed.

David R. Gates

12 Mar 98
(Date)

Dave Gates
Technical Review Team Leader
CEMVS-PD-F

Owen H. Dutt

12 Mar 98
(Date)

Owen Dutt
Chief, Planning Division
CEMVS-PD

CERTIFICATION OF LEGAL REVIEW

The Definite Project Report on the Stag Island Habitat Rehabilitation and Enhancement Project, Pool 25, Mississippi River, Lincoln County, Missouri has been fully reviewed by the Office of Counsel, USAED, St. Louis.

William P. Levins
Assistant Deputy Counsel

March 19 1998
(Date)

16. FINDING OF NO SIGNIFICANT IMPACT (FONSI)

STAG ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
POOL 25, MISSISSIPPI RIVER
LINCOLN COUNTY, MISSOURI

1. I have reviewed and evaluated the documents concerning the proposed rehabilitation and enhancement of the Stag Island project area. The objectives of the project are: (1) to modify existing off-channel aquatic habitats to create deepwater slough habitat, including overwintering habitat for fish, (2) to reduce sedimentation and turbidity in these off-channel areas, (3) to maintain and accumulate fallen woody debris along banklines of adjacent islands and the mainland, (4) to create slackwater habitat for migratory waterfowl, and (5) to improve slough habitat on Stag Island for moist soil management.

2. Prior to my decision, I evaluated the pertinent data and information which led to the development of the various potential alternatives. I have reviewed the steps in the evaluation process that produced the recommended plan.

3. All identified alternatives have been studied, and major findings of this investigation include the following:

a. The "No Action" measure was evaluated but subsequently rejected. This measure would do nothing to address the study objectives.

b. The recommended project is viable, acceptable, and an effective measure to address the study objectives. It consists of the construction of a 1,300-foot long emergent stone dike across the top of the side channel and the upper chute in the Stag Island complex. This dike will have a crown elevation of 438 feet NGVD, which is four feet above normal pool (434 feet NGVD). Revetments and rock armoring will be required at the head of Stag Island at the Missouri bankline, and at the head of the unnamed island between the shoreline and Stag Island. The lower end of the project area will remain open to the river.

4. The possible consequences of the recommended plan have been studied for physical, environmental, cultural, social, and economic effects. Major conclusions of this study are as follows:

a. It is anticipated that substantial habitat benefits will accrue to riverine fishes by the creation of about 127 acres of slough or backwater habitat from the side channel and upper chute. Reductions in sedimentation and turbidity, accumulation of woody debris, and the establishment of some submergent aquatic vegetation are expected in the protected area. These developments and the slackwater effect to be created by the emergent dike will provide critical spawning and rearing habitat for many fish species on average about nine of every ten years. Critical overwintering habitat for young-of-the-year and adult fish will be provided from year to year in the nearly 100-acre area of the former side channel.

b. Migratory waterfowl, especially diving ducks, are expected to benefit. The newly-created slackwater area will provide resting habitat for this wildlife group, and feeding opportunities are expected to develop with the establishment of submergent aquatic vegetation and associated invertebrate populations.

c. Wetland wildlife using the sloughs on Stag Island are expected to benefit because the emergent dike should reduce the rate of sedimentation in these wetlands, and prolong their life as valuable natural moist soil management areas.

d. The recommended plan will require the loss of less than one acre of bottomland forest.

e. The recommended plan will not adversely affect any Federally threatened or endangered species.

f. The recommended plan will not adversely affect any historical properties.

g. The recommended plan will have no significant adverse effects on the physical, social, or economic conditions within the project area and surrounding communities.

5. Based on my analysis and evaluation of the alternative courses of action presented in the Environmental Assessment, I have determined that the rehabilitation and enhancement of the Stag Island project area will have important beneficial effects on the quality of the environment, but no significant adverse environmental effects. Therefore, no Environmental Impact Statement (EIS) will be prepared prior to proceeding with this action.

20 Mar 98

Date

Thomas J. Hodgini
Colonel, U.S. Army
District Engineer

ATTACHMENT 1

APPENDICES

APPENDIX DPR-B

CORRESPONDENCE PERTAINING TO DRAAFT DPR

FOREWORD

APPENDIX DPR-B provides: (1) the District's letter requesting a joint DPR/EA and regulatory review by the public; (2) the Joint Public Notice; (3) letters of comment received and District's responses to those comments, as appropriate.

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

SEP 04 1997

REPLY TO
ATTENTION OF:

Planning Division
Plan Formulation Branch

Dear Reviewer:

A copy of the Stag Island Habitat Rehabilitation and Enhancement Project draft Definite Project Report (DPR) with integrated Environmental Assessment (EA) and an unsigned Finding of No Significant Impact (FONSI) is enclosed for your review.

The project is part of the Upper Mississippi River System Environmental management Program. This program was established by Congress in 1986 for the planning, construction, and evaluation of measures for fish and wildlife habitat improvement. The program includes the development of a number of habitat projects along the Mississippi River System.

All written comments received will also be used as part of the public interest review in conjunction with the Rivers and Harbors Act (Section 10) and Clean Water Act (Section 404) compliance documentation (see enclosed Public Notice No. P-2081). These comments will be given appropriate consideration in the preparation of the final DPR/EA and other compliance documentation.

All written comments regarding the DPR/EA, Section 10 and Section 404 compliance documentation should be submitted to the St. Louis District (address and date) as noted in the public meeting announcement. For a list of report reviewers, see DPR Appendix D Distribution List.

Sincerely,

Owen D. Dutt
Chief, Planning Division

Enclosures

Public Notice

U.S. ARMY CORPS
OF ENGINEERS
St. Louis District
Gateway to Excellence

Reply To:
U.S. Army Corps of Engineers
Attn: CEMVS-CO-F
1222 Spruce Street
St. Louis, MO 63103-2833
Postmaster Please Post Conspicuously Until:

Public Notice No.
P-2081
Public Notice Date
September 4, 1997
Expiration Date
October 5, 1997

Regulatory Branch
Mississippi River (P-2081)
File Number: 199701940

JOINT PUBLIC NOTICE
U.S. ARMY CORPS OF ENGINEERS
AND
STATE OF MISSOURI

1. U.S. Army Corps of Engineers, St. Louis District, 1222 Spruce Street, St. Louis, Missouri, 63103-2833, has applied:

a. To the St. Louis District, Corps of Engineers, for a Department of the Army permit to place fill material into waters of the United States in conjunction with the proposed Stag Island habitat rehabilitation and enhancement project. This project is proposed by the St. Louis District under the authority of the Upper Mississippi River System's Environmental Management Program (EMP). Stag Island is located between approximate Upper Mississippi River miles 247.7 and 249.5, in Lincoln County, Missouri, near the downstream end of Pool 25. Applicant's proposal will be processed under the provisions of Section 10 of the Rivers and Harbors Act of 1899, and Section 404 of the Clean Water Act.

b. To the Missouri Department of Natural Resources, Water Pollution Control Program for state certification of the proposed work in accordance with Section 401 of the Clean Water Act. The certification, if issued, will express the Agency's opinion that the proposed activities will not violate applicable water quality standards. Written comments concerning possible impacts to waters of Missouri should be addressed to: Water Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176.

2. a. The project consists of constructing a 1,300 foot long emergent stone dike extending from the Missouri shoreline to the tip of Stag Island. The dike will be constructed to a height of 4 feet above normal pool (4 feet above 434.00 NGVD). It will require about 30,000 tons of grade A stone. The dike cross-section consists of a 6 foot wide crown, 1 vertical to 2 horizontal side slopes, and a base width varying between 70 feet and 90 feet, depending on the elevation of the channel bottom along the alignment. The alignment will be placed at or adjacent to a natural ridge where possible as an effort to minimize quantities of construction material.

b. A total of about 700 linear feet of revetments and rock armoring will be required at the head of Stag Island, at the Missouri bankline, and at the head of the unnamed island between the shoreline and Stag Island. The total quantity of revetment material needed for this portion will be about 8,000 tons of grade A stone.

c. The project purpose is to create about 127 acres of slackwater habitat from existing side channel habitat. It is expected that sedimentation and turbidity will be reduced by the dike, water clarity will improve, submergent aquatic vegetation will become establish and woody debris will accumulate in the protected area. This slackwater area is expected to serve as spawning, rearing, and overwintering habitat for many riverine fishes, and as resting and feeding habitat for migratory birds, especially diving ducks. The dike is also expected to retard the accumulation of sediments in two small sloughs on Stag Island, and delay the encroachment of woody vegetation in these productive native moist soil areas.

3. Based on our initial processing of the applicant's proposal, the action is not expected to result in any significant adverse effects on the quality of the human environment. However, a final determination of the need for an environmental impact statement will not be made

until the St. Louis District has completed its full review of this application. The review will include our evaluation of any written responses received as a result of this public notice.

4. The St. Louis District has consulted the National Register of Historic Places and the Federal Register and no property listed in the Register or proposed for listing is located in the project area. This is the extent of our knowledge of historic properties in the project area at this time. We will evaluate the input by the State Historic Preservation Officer and others in response to this public notice. If warranted, we will require a reconnaissance survey of the project area. The St. Louis District will comply with the National Historic Preservation Act of 1966 and 36 CFR 800.

5. The proposed project is within the historic range of the federally endangered gray bat (**Myotis grisescens**), and the federally threatened Bald eagle (**Haliaeetus leucocephalus**). A preliminary determination, in compliance with the Endangered Species Act as amended, has been made that this proposed activity will not affect species designated as threatened or endangered, or adversely affect critical habitat. In order to complete our evaluation, comments are solicited by this public notice from the Fish and Wildlife Service and other interested agencies and individuals.

6. Any interested parties, particularly navigation interests, Federal and state agencies for the protection of environmental and cultural resources, and the officials of any state, town, or local associations whose interest may be affected by this work, are invited to submit to this office: written facts, arguments, or objections on or before October 5, 1997. The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefits which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. Evaluation of the impact of the activity on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under authority of Section 404(b) of the Clean Water Act. All factors which may be relevant to the proposal will be considered; among those are conservation, economics, aesthetics, general environmental concerns; wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership, and, in general, the needs and welfare of the people. A permit will be issued only if it is found not contrary to the public interest.

7. The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties; water quality, general environmental effects; and the other public interest factors listed above. Comments are also used to determine the overall public interest of the proposed activity.

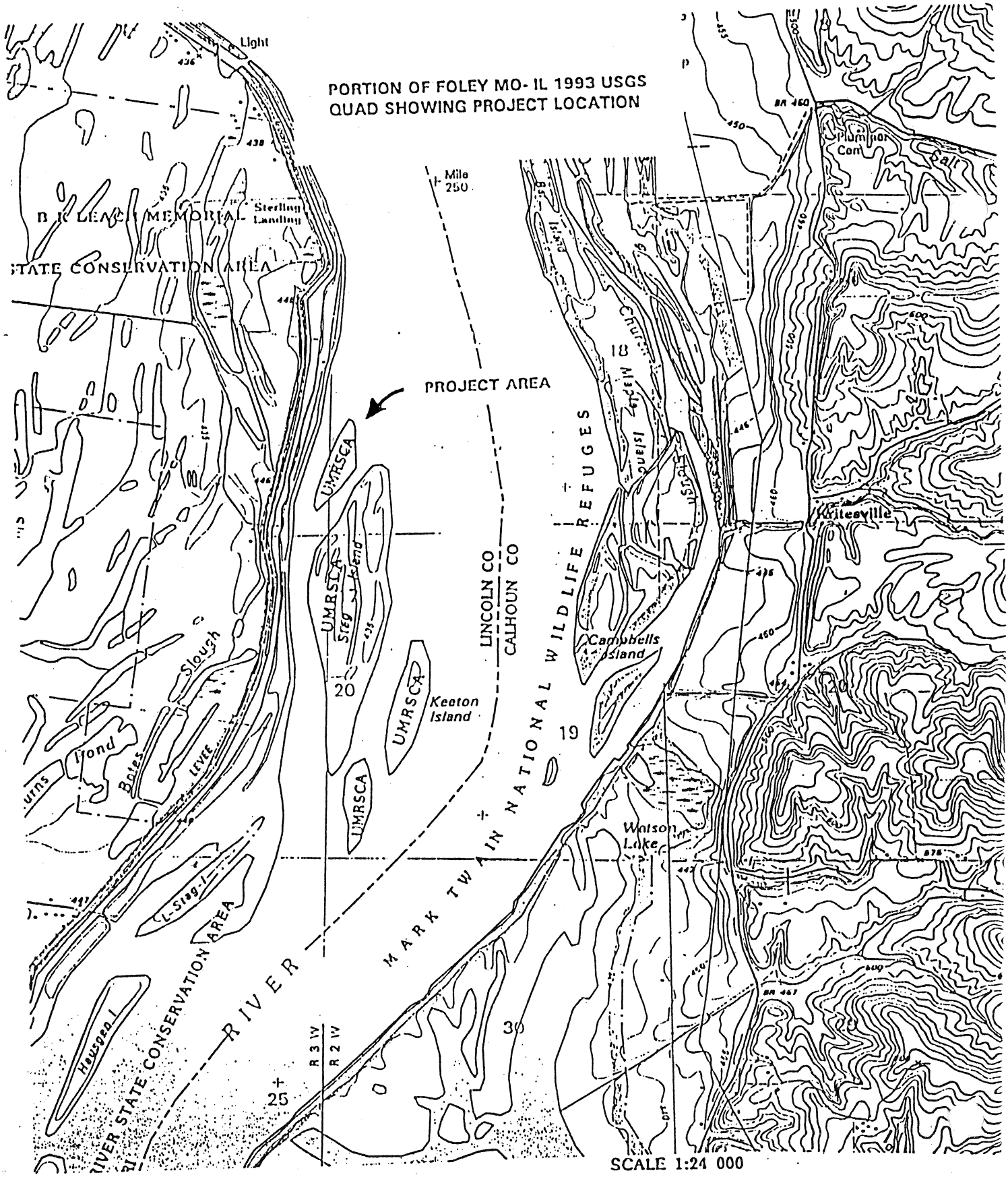
8. Any person may request that a public hearing be held to consider applicant's proposal, provided such request identifies significant issues that would warrant additional public review and comment. All replies to this public notice should be submitted in writing to the District Engineer, U.S. Army Corps of Engineers, St. Louis District, Attn: CEMVS-CO-F, 1222 Spruce Street, St. Louis, Missouri 63103-2833, within 30 days of the date of this notice. Michael Ricketts or Edith List, telephone (314) 331-8811, may be contacted for additional information. File Number is 199701940.

Danny D. McClendon

for Michael A. Brazier
Chief, Regulatory Branch

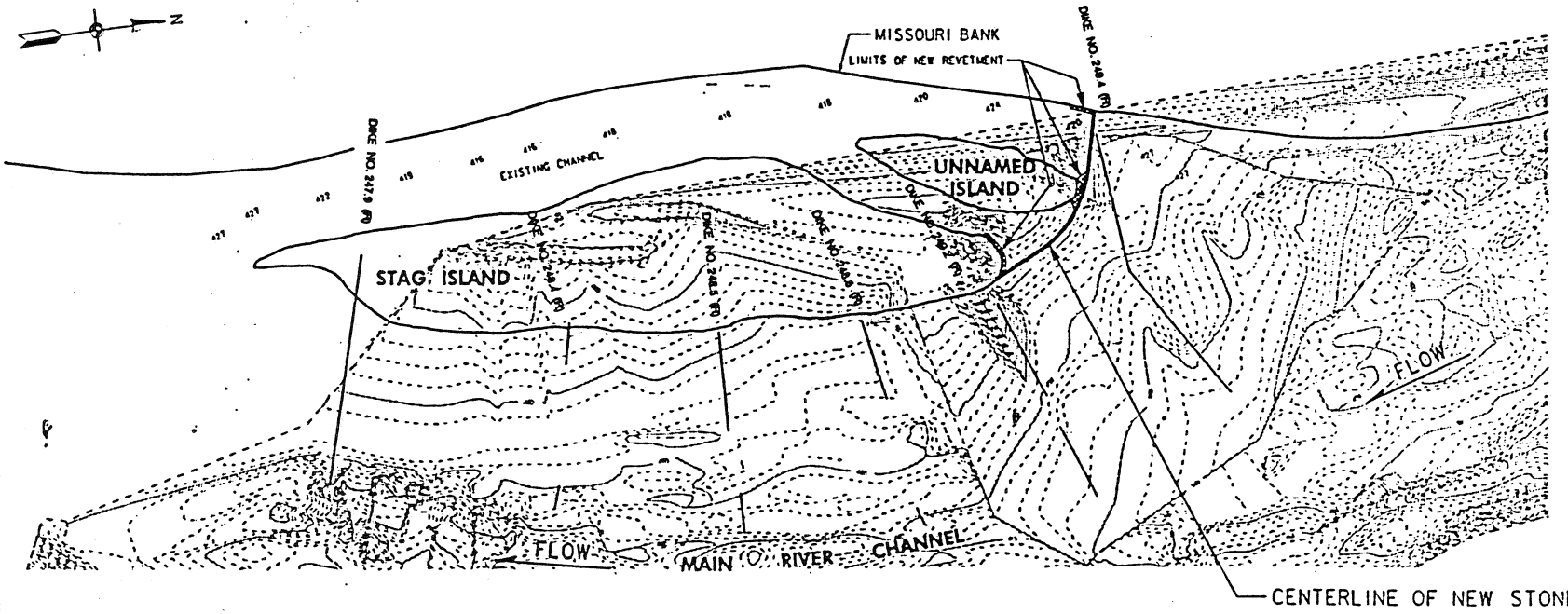
Attachment

NOTICE TO POSTMASTERS:
It is requested that this notice be conspicuously and continually posted for **30 days** from the date of the issuance of this notice.



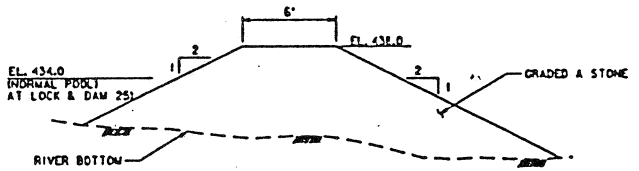
PROJECT MAP
P-2081
SHEET 1 OF 2

CONTOUR INTERVAL 5 AND 20 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929



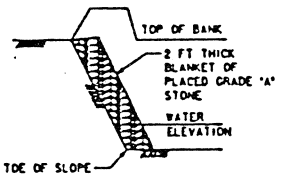
PLAN

SCALE: 1" = 400'



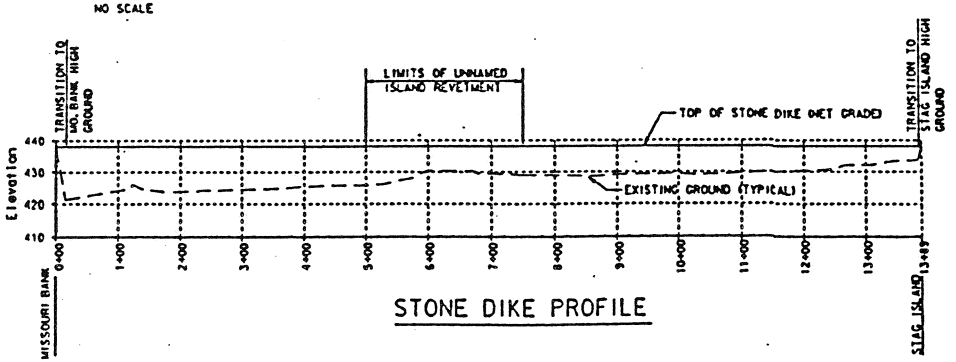
STONE DIKE - TYPICAL SECTION

NO SCALE



SECTION AT REVETMENT

NO SCALE



STONE DIKE PROFILE

NOTES:

1. ORIGINAL HYDROGRAPHIC SURVEY DATA PRODUCED IN 1989, TITLED "AFTER DREDGE SURVEY".
2. ADDITIONAL HYDROGRAPHIC SURVEY DATA WAS PRODUCED IN 1996 AND ADDED TO THE SURVEY DATA IN NOTE 1. THIS DATA IS IN THE VICINITY OF THE NORTH ENDS OF STAG ISLAND AND THE UNNAMED ISLAND.

SYMBOL	DESCRIPTION	DATE	APPROVED
	REVISIONS		

U.S. ARMY ENGINEER DISTRICT, ST. LOUIS
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

DESIGNED BY: T. LINCOLN
DRAWN BY: A. KELLY
CHECKED BY: T. LINCOLN
DATE: APRIL 1997

UPPER MISSISSIPPI RIVER SYSTEM
POOL 25, LINCOLN COUNTY, MISSOURI
DEFINITE PROJECT REPORT
ENVIRONMENTAL MANAGEMENT PROGRAM
STAG ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT

PLAN AND SECTION

D | DACW 43 | FIGURE 6.1

SITE PLAN
P-2081
SHEET 2 OF 2

MISSOURI DEPARTMENT OF CONSERVATION

Headquarters

2901 West Truman Boulevard, P.O. Box 180, Jefferson City, Missouri 65102-0180
Telephone: 573/751-4115 ◆ Missouri Relay Center: 1-800-735-2966 (TDD)

JERRY M. CONLEY, Director

September 18, 1997

Colonel Thomas J. Hodgini
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, MO 63103-2833

ATTN: Mr. Tim George, CELMS-PD-AE

Dear Colonel Hodgini:

We appreciate the opportunity to comment on the June, 1997 Draft Definite Project Report (DDPR) for the Stag Island Rehabilitation and Enhancement Project scheduled for construction in Pool 25, Mississippi River, Lincoln County, Missouri. Members of my staff have reviewed this document and have provided the following comments:

We believe habitat projects should be designed to provide the maximum environmental benefits within an acceptable cost. This guideline, we feel applies to the project's main feature, the emergent stone dike constructed to reduce sediment entrance and accumulation in project associated backwaters. Our biolcgists believe this structure should be constructed at 440 feet NGVD, six feet above flat pool, rather than the DDPR's recommended 338 feet NGVD elevation. Their reasoning is the higher structure provides, according to analysis cited in the DDPR, up to 10% greater protection from overtopping than the lower elevation. This protection affords not only bluegill, as mentioned in the DDPR, but other Centrarchids (e.g., crappie and largemouth bass) an increase in the probability that spawning and nursery conditions, within the off-channel habitat, will be optimal. We believe the projected cost increase of $140,000 to construct the dike at 440 feet NGVD is justified based on the environmental benefits projected over a 50 year project life. With this increase, the project's anticipated cost is $873,000 which is well below the average cost associated with EMP habitat projects currently being planned and constructed along the upper Mississippi River system.

An editorial comment, on Page 44 of the DDPR, "c. Missouri Department of Natural Resources," should read, "Missouri Department of Conservation."

Again, we are appreciative for the opportunity to provide comments on this document. If you should have questions pertaining to our comments, please contact Mr. Gordon Farabee at the above address.

Sincerely,

DANIEL J. WITTER
POLICY COORDINATION CHIEF

c: Joyce Collins, U. S. Fish and Wildlife Service

FEB 20 1998

Planning Division
Plan Formulation Branch

Mr. Daniel J. Witter
Policy Coordination Chief
Missouri Department of Conservation
2901 West Truman Boulevard
P.O. Box 180
Jefferson City, Missouri 65102-0180

Dear Mr. Witter:

This is in response to your letter dated September 18, 1997 regarding the Draft Definite Project Report (DDPR) with integrated Environmental Assessment prepared by the St. Louis Corps District for the Stag Island Habitat Rehabilitation and Enhancement Project (HREP). Your letter provided a recommendation that the District construct the emergent dike structure to a higher 440 NGVD elevation.

The District has consulted with its Mississippi Valley Division (MVD) on the issue of dike structure height. MVD's response is that the District should generally select project habitat structure increments consistent with the results of the incremental cost analysis. For the Stag Island project, this means the highest elevation structure that can be economically justified is elevation 438 NGVD.

Your Department provided a supplemental rationale in support of a departure from the economically most viable option; however, the District has reviewed that rationale and remains unconvinced that a higher structure is warranted.

The Corps' installation of a stone dike structure (as with any rock structure placed in the river) includes a degree of overbuild to account for the effects of slumpage and settlement.

Please note that this subject was discussed and agreed to with you and your staff during my recent visit to your office at Jefferson City.

Sincerely,

signed
OWEN D. DUTT
Chief, Planning

Owen D. Dutt
Chief, Planning Division

Copy Furnished:

Ms. Joyce Collins
Assistant Field Supervisor
U.S. Fish and Wildlife Service
Marion Illinois Suboffice (ES)
8588 Route 148
Marion, Illinois 62959

DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
1222 SPRUCE STREET
ST. LOUIS, MISSOURI 63103-2833

REPLY TO
ATTENTION OF:

October 22, 1997

Plan Formulation Branch
Planning Division

Mr. Ray Jackson
Lincoln County Flood Plain Management
County Court House
201 Main Street
Troy, Missouri 63379

Dear Mr. Jackson,

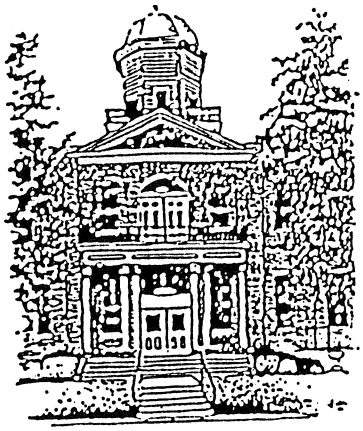
The St. Louis District's proposed construction of a 1,300-foot-long emergent stone dike, located on the Mississippi River at approximate river mile 249 in Lincoln County, Missouri, will not increase the Mississippi River's 100-year frequency flood elevation. This structure will extend from the Missouri shoreline to the tip of Stag Island, and will have a crown elevation of 438 feet NGVD (four feet above normal pool).

I trust this information will be helpful to you. If you have any questions, please call me at (314) 331-8483.

Sincerely,

Richard F. Astrack

Richard F. Astrack, P.E.
Flood Plain Management Officer



LINCOLN COUNTY
FLOODPLAIN MANAGEMENT

201 MAIN STREET TROY MO 63379

PHONE: 314-528-3738 FAX: 314-528-5528

RAYMOND JACKSON
MANAGER

November 3, 1997

Tim George (PD-A)
Department of the Army
St Louis District Corps of Engineers
1222 Spruce Street
St Louis MO 63103-2833

Dear Tim:

Enclosed are two (2) copies of Lincoln County Floodplain Development Permit #97-021 for the proposed 1300 foot emergent rock dike to be constructed near mile 249.5 in the upper Mississippi River at the northern tips of Ross & Stag Islands (File Number 1997011940). If you would please, sign both copies and return one in the enclosed self addressed stamped envelope.

Thank You.

Please feel free to contact me should you have any questions.

Best Regards,

Raymond F Jackson
Lincoln County Floodplain Manager

LINCOLN COUNTY FLOODPLAIN DEVELOPMENT PERMIT

Permit / Application # 97-021 *Permit Fee:* $0.00 *Date:* 11/03/1997

1. *Name of Applicant:* US Army Corps of Engineers, St Louis District

2. *Address of Development Site:* Near Mile 249.5 of the Upper Mississippi River from Missouri Shoreline to Northern Tips of Ross & Stag Islands 11-4.0-17-00-00-02-00

3. *Type of Development:* New Construction

   Filling __Yes__ *Grading* ____ *Excavation* ____ *Routine Maintenance* __Yes__

   Minor Improvement ____ *Substantial Improvement* ____ *New Construction* __Yes__

   Pre-improvement Value of Structure: $ *% Damage:* *Cost of improvement:* $

4. *Description of Development:* A 1300 Foot Long Emergent Stone Dike

5. *Property located in a designated floodway?* Yes

IF YES, AND IS SUBSTANTIAL IMPROVEMENT OR NEW CONSTRUCTION, CERTIFICATION MUST BE PROVIDED PRIOR TO THE ISSUANCE OF A PERMIT TO DEVELOP THAT THE PROPOSED DEVELOPMENT WILL RESULT IN NO INCREASE IN THE BASE (100 YEAR) FLOOD ELEVATION.

6. *Property located in designated floodway fringe?* No

   a) Elevation of Base (100 year) Flood: 448

   b) Elevation / Flood proofing requirement:

   c) Elevation of the proposed development site: 438

THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING THE BASEMENT FLOOR) OF ANY NEW OR SUBSTANTIALLY IMPROVED RESIDENTIAL BUILDING WILL BE ELEVATED A MINIMUM OF ONE (1) FOOT ABOVE THE BASE (100 YEAR) FLOOD ELEVATION. IF THE PROPOSED DEVELOPMENT IS A NON-RESIDENTIAL BUILDING, THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING THE BASEMENT FLOOR) WILL BE ELEVATED OR FLOOD PROOFED ABOVE THE BASE (100 YEAR) FLOOD ELEVATION.

7. *Source of Base Flood Elevation Data if not available on FIRM:*

   FIRM Panel Number: 135C *FIRM Zone :* AE *FIRM Revision Date:* April 2, 1993

8. *List any other sources of permits that may be required:* Engineering "No-Rise" Certificate
   Department of the Army to place fill into waters of the United States

ALL PROVISIONS OF THE LINCOLN COUNTY FLOOD DAMAGE PREVENTION ORDINANCE NUMBER 60.3(d) SHALL BE COMPLIED WITH.

PLANS AND SPECIFICATION APPROVED THIS 3rd DAY OF November, 1997

X _____
Signature of Developer / Owner

Raymond T. Jackson
Authorizing Official

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES

524 South Second Street, Springfield 62701-1787

Jim Edgar, Governor ● Brent Manning, Director

September 25, 1997

Mr. Michael A. Brazier
Chief, Regulatory Branch
Department of the Army
St. Louis District, Corps of Engineers
1222 Spruce Street
St. Louis, Missouri 63103-2833

Dear Mr. Brazier:

The Illinois Department of Natural Resources, Office of Realty and Environmental Planning, has reviewed the project(s) listed below and has no objections to permit issuance:

Permit No.	Applicant
199701940	US Army Corps of Engineers

Please contact me if we can be of further assistance.

Sincerely,

Robert W. Schanzle
Permit Program Manager

RWS:rs 8-23(97)

cc: IDNR/OWR (Dalton)
IEPA (Yurdin)
USFWS (Collins)
USEPA (Pierard)

This recommendation regarding the issuance/denial of the U.S. Army Corps of Engineers permit by the IDNR, Office of Realty and Environmental Planning does not preclude permit decisions made by the IDNR, Office of Water Resources under the Illinois Rivers, Lakes and Streams Act.

APPENDIX DPR-D

DISTRIBUTION LIST

FOREWORD

APPENDIX DPR-D provides the list used to distribute copies of the Draft DPR.

APPENDIX D

DPR DISTRIBUTION LIST
STAG ISLAND
HABITAT REHABILITATION AND ENHANCEMENT PROJECT
POOL 25, MISSISSIPPI RIVER
LINCOLN COUNTY, MISSOURI

Distribution List	No. of Copies

Elected Officials (U.S.)

Honorable Christopher Bond
United States Senator
8000 Maryland Avenue
Suite 440
Clayton, MO 63105

Honorable John Ashcroft
United States Senator
8000 Maryland Avenue
Suite 440
Clayton, MO 63105

Honorable Kenny C. Hulshof
Representative in Congress
33 East Broadway, Suite 280
Columbia, MO 65203

Elected Officials (MO State and Local)

Honorable Philip Smith
Missouri House of Representatives, District 11
201 West Capitol Avenue, Room 207B
Jefferson City, MO 65101

Honorable Bill Luetkenhaus
Missouri House of Representatives, District 12
201 West Capitol Avenue, Room 233A
Jefferson City, MO 65101

Honorable Ted House
Missouri Senate, District 2
State Capitol Building, Room 227
Jefferson City, Missouri 65101

Mayor
St. Peters, MO 63376

Mayor
Old Monroe, MO 63369

Mayor
Winfield, MO 63389

Mayor
Foley, MO 63347

Mayor
Elsberry, MO 63343

Corps Offices

Commander, U.S. Army Engineer Division — 12 (D), 30 (F)
Mississippi Valley
ATTN: CEMVD-PE-F
P.O. Box 80
1400 Walnut Street
Vicksburg, MS 39180-0080

Commander, U.S. Army Regional Headquarters — 3 (D), 10 (F)
Great Lakes
ATTN: CELRD-PE-PD-PL
111 N. Canal Street
Chicago, IL 60606-7205

Commander, U.S. Army Engineer District
Rock Island
ATTN: CEMVR-PD
P.O. Box 2004, Clock Tower Building
Rock Island, IL 61204-2004

Commander, U.S. Army Engineer District
St. Paul
ATTN: CEMVP-PD
1135 USPO and Custom House
180 East Kellogg Blvd.
St. Paul, MN 55101-1479

Commander, U.S. Army Engineer Waterways
Experiment Station, CEWES
3909 Halls Ferry Road
Vicksburg, MS 39180-6199

Federal Agencies

U.S. Fish & Wildlife Service

Director, Region 3 — 5 (D) (F)
Fish and Wildlife Service
Federal Building, Ft. Snelling
Twin Cities, Minnesota 55111

Mr. Rick Nelson
U.S. Fish and Wildlife Service
4469 48th Avenue Court
Rock Island, IL 61201

3 (D) (F)

Dr. Ken Lubinski
U.S. Fish and Wildlife Service
Environmental Management Technical Center
575 Lester Drive
Onalaska, Wisconsin 54650

Ms. Pam Thiel
U.S. Fish and Wildlife Service
Environmental Management Technical Center
575 Lester Drive
Onalaska, Wisconsin 54650

Dr. Robert L. Delaney
Program Manager
U. S. Fish and Wildlife Service
Environmental Management Tech. Center
575 Lester Drive
Onalaska, Wisconsin 54650

3 (D) (F)

Mr. Ross Adams
EMP Coordinator
Mark Twain National Wildlife Refuge
U. S. Fish and Wildlife Service
1704 North 24th Street
Quincy, Illinois 62301-3304

Ms. Joyce Collins
U. S. Fish and Wildlife Service
Marion Suboffice (MISO)
RR 3, Box 328
Marion, IL 62959

Mr. Chuck Surprenant
U. S. Fish and Wildlife Service
Crab Orchid Wildlife Refuge
P.O. Box J
Carterville, IL 62918

Ms. K. L. Drews
U. S. Fish and Wildlife Service
Mark Twain National Wildlife Refuge
Calhoun Division
P.O. Box 107
Brussels, IL 62013

Mr. Keith Beske
U. S. Fish and Wildlife Service
Upper Mississippi Wildlife and Fish Refuge
51 E 4th Street
Room 101
Winona, Minnesota 55987

U. S. Fish and Wildlife Service
Columbia Missouri Field Office (CMFO)
608 East Cherry Street, Room 207
Columbia, MO 65201-7712

General

Commander (d)
Second Coast Guard District
1222 Spruce Street
St. Louis, MO 63103

District Chief, WRD
U. S. Geological Survey
1400 Independence Road
Rolla, MO 65401

State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
555 Vandiver
Columbia, MO 65201

District Conservationist
Troy Field Office
U.S. Department of Agriculture
Soil Conservation Service
Rt. 1 Box 3D
Troy, MO 63379

Chairman, Advisory Council on
Historic Preservation
1100 Pennsylvania Avenue, Northwest
809 Old Post Office Building
Washington, DC 20004

Director, Office of Environmental
Policy and Compliance
Department of the Interior
Main Interior Building, MS 2340
1849 C Street, NW
Washington, DC 20240

12 (D)
6 (F)

Ms. Lynn Kring
Acting Chief, Environmental

Review and Coordinating Section
U.S. EPA Region VII
726 Minnesota Ave.
Kansas City, MO 66101

5 (D)
3 (F)

Director
Office of Federal Activities (A-104)
U. S. Environmental Protection Agency
401 M Street, Southwest
Washington, DC 20460

Director
Federal Emergency Management Agency
911 Walnut, Room 210
Kansas City, MO 64106

Mr. Robert F. Stewart
Regional Environmental Officer
U.S. Department of the Interior
Office of Environmental policy and Compliance
Denver Federal Center, Building 56, Room 1003
P.O. Box 25007 (D-108)
Denver, Colorado 80225-0007

State or Local Agencies

Missouri Department of Conservation

5 (D) (F)

Mr. Gordon Farabee
Environmental Coordinator
Missouri Department of Conservation
P.O. Box 180
2901 North Ten Mile Drive
Jefferson City, MO 65102

Director
Missouri Department of Conservation
P.O. Box 180
Jefferson City, MO 65012

Mr. Ken Dalrymple
Wildlife Area Manager
Upper Mississippi Wildlife Area
Missouri Department of Conservation
Box 201
Elsberry, MO 63343

Mr. Ken Brummett
Missouri Department of Conservation
Conservation Service Center
Hannibal, MO 63401

Illinois Department of Natural Resources

Director
Illinois Department of Conservation
524 South Second Street
Springfield, IL 62706

Illinois Department of Conservation
Division of Planning
524 South Second Street
Springfield, IL 62706

Mr. Neil Booth
Illinois Department of Conservation
Mississippi River State Fish
and Wildlife Area
RR 1, Box 182
Grafton, IL 62937

Mr. Rick Messinger
Illinois Department of Conservation
4521 Alton Commerce Parkway
Alton, IL 62002

General

Ms. Claire F. Blackwell
Director and Deputy State Historic Preservation Officer
Historic Preservation Program
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Director
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, MO 65102

Missouri Department of Natural Resources
Division of Environmental Quality
P.O. Box 176
Jefferson City, MO 65102

Missouri Department of Natural Resources
Division of Planning and Policy
P.O. Box 176
Jefferson City, MO 65102

Missouri Department of Natural Resources
Missouri Clean Water Commission
P.O. Box 1368
Jefferson City, MO 65102

Director
Water Resources Research and Planning
Missouri Department of Natural Resources
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