PREFACE

The Pool 8 Phase III Habitat Rehabilitation and Enhancement Project, constructed by the Corps of Engineers, were divided among five stages. In accordance with Section 906(e) of the Water Resources Development Act of 1986, and policies set forth in the Fourth and Fifth Annual Addenda, the U.S. Fish and Wildlife Service has responsibility for the operation and maintenance of project features located on the Upper Mississippi River National Wildlife and Fish Refuge. The Corps of Engineers has prepared this manual to assist the U.S. Fish and Wildlife Service in fulfilling this responsibility.

The manual and appendices contain the latest information pertinent to operation and maintenance of this project. The project as designed and constructed will improve the quality of habitat for a variety of fish and wildlife species in Pool 8. The planning, design, and construction of the project were the result of a cooperative effort on the part of the involved Federal and State agencies and the public. The continuation of this cooperation and coordination as part of the operation and maintenance of the project will be important to the success of the project and is strongly recommended.

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St. Paul District, Corps of Engineers
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UPPER MISSISSIPPI RIVER SYSTEM
ENVIRONMENTAL MANAGEMENT PROGRAM

POOL 8 PHASE III, UPPER MISSISSIPPI RIVER
VERNON COUNTY, WISCONSIN

OPERATION AND MAINTENANCE MANUAL

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APPENDICES

Introduction

This manual has been prepared to serve as a guide for the operation and maintenance of the Pool 8 Islands Phase III Habitat Rehabilitation and Enhancement Project in Vernon County, Wisconsin and Houston County, Minnesota. Operation and maintenance instructions presented are consistent with the general procedures found in the Pool 8 Islands Phase III Definite Project Report dated April 2002. This manual has been written for project and management personnel familiar with the project. It does not contain detailed information which is common knowledge to personnel or which is presented in other existing manuals or regulations.

For ease in use, this manual is divided into two sections.

Part I. This section describes the project features and provides historical information on the project.

Part II. This section gives details on the operation and maintenance of the project.

PART I – PROJET FEATURES AND CONSTRUCTION HISTORY

The Pool 8 Islands Phase III project was authorized under the provisions of the 1985 Supplemental Appropriations Act (Public Law 99-88) and Section 1103 of the Water Resources Development Act of 1986 (Public Law 99-662). The project is located in the lower reaches of pool 8, about 15 miles below La Crosse, Wisconsin. The project lies within the Upper Mississippi River National Wildlife and Fish Refuge. Project drawings (appendix A) show the location of the project.

The Pool 8 Islands Phase III project is located on Federal lands managed as a National Wildlife Refuge. As such, operation and maintenance of those features are to be carried out in compliance with Section 906(e) of the 1986 Water Resources Development Act and policies set forth in the Fourth and Fifth Annual Addenda.

DESCRIPTION OF THE PROJECT

General/Background

The Pool 8 Islands Phase III Habitat Rehabilitation and Enhancement Project is the third phase of a multi-phase effort to restore islands and river processes in lower pool 8. Since 1939, over 80 percent of the island acreage in lower pool 8 had been lost to erosion.

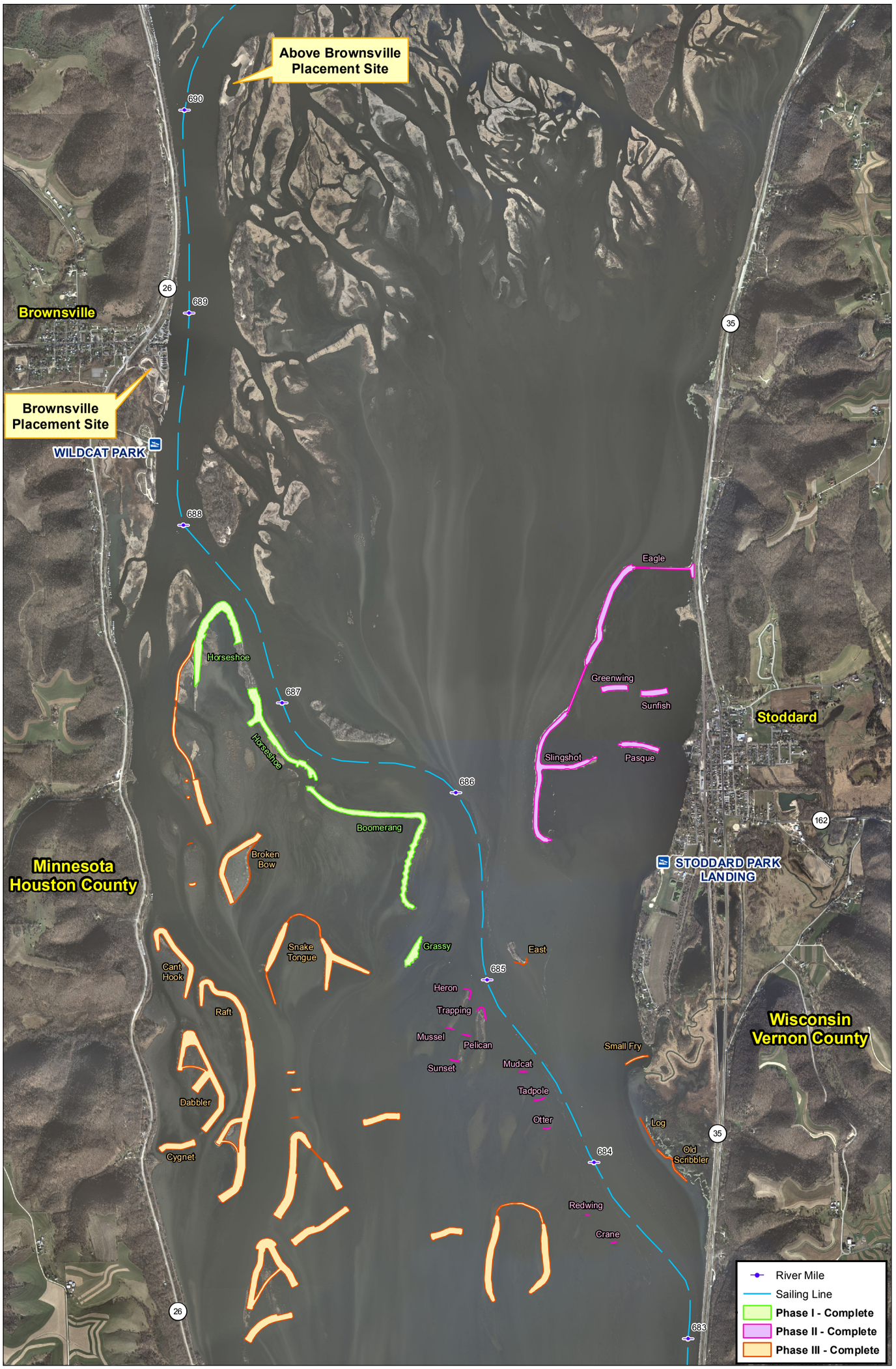
The habitat concerns within the study area center around the general degradation of habitat quality in lower pool 8. This degradation has been the result of the loss of islands, declining bathymetric diversity, and a decline in aquatic vegetation over the past few decades. Most of the study area lies within a closed portion of the Upper Mississippi River National Wildlife Refuge and is considered important habitat for migrating waterfowl and other water birds. This decline in migration habitat quality is of great concern to the U.S. Fish and Wildlife Service and State resource management agencies.

The planning process focused on the restoration of islands and river processes to restore habitat diversity within the study area. Because it is not possible to restore or create ideal habitat conditions for

all forms of fish and wildlife, features were designed and evaluated primarily to improve conditions for migratory waterfowl. However, once the basic island layouts and designs were developed, they were modified to benefit other fish and wildlife wherever possible. For example, islands were positioned to maintain and/or encourage flowing channels for riverine fish or to provide protected deepwater habitat for overwintering Centrarchids. Features such as mudflats were incorporated into the island designs to provide habitat for shorebirds and wading birds.

Due to its size, differing site conditions, and differing habitat goals and objectives, the study area was subdivided into five smaller areas for ease of planning. This allowed the planning of habitat restoration to be more efficient and to better meet the habitat needs within each of these areas. The various areas were separated into five construction stages; 1, 2a, 2b, 3a, and 3b. Stage 1 was the completion and protection of Islands E1-E3 in the Three East area. Stage 2a was the construction of Island N1 and seed islands N3-N6. Stage 2b was the construction of seed islands Islands N7, N8, and W1-W4. Stage 3a was the construction of Islands N2, C2-C5, and seed islands C2a, C2b, and C2c and Stage 3b was the construction of Islands C6-C8.

The Definite Project Report/Environmental Assessment (SP-20), Pool 8 Islands Phase III Habitat Rehabilitation and Enhancement Project, April 2002, provide additional details on the project.



Mississippi River - Pool 8
Environmental Management Program (EMP)

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Design Considerations

Islands

The islands were designed to serve a number of functions in the Pool 8 area. The most important of these are to (1) restore habitat diversity; (2) reduce flows and current velocities; and (3) reduce the effects of wind and wave action. All of the islands contribute to improving habitat diversity. See section8.1 in the DPR/EA for additional information on island design.

A number of considerations went into the basic island cross section. Island width is necessary to provide the mass to withstand river forces and insure the islands do not breach or erode away during the 50-year project life. However, excessive width was undesirable from the perspective of cost control. Total island width ranges from 40 feet to 160 feet, depending upon island location and height. These were considered to be the minimum widths necessary to insure stable islands.

Fine borrow material was primarily taken from the Schnick's Bay location with some additional material taken from Stoddard Bay. Island cross sections were designed to minimize the use of fine materials by varying the depth of fine material between six and twelve inches. From a stability and constructability perspective it is not desirable to place fine materials in the water. Therefore, the bases of the islands above the normal summer water surface elevation) were constructed of granular fill (sand). Granular borrow sites included the main channel and the Above Brownsville Dredge material placement Site (also known as Crater Island)

The bulk of the material (fine fill) placed above the sand had no special requirement other than it had to be borrowed from within Schnick's Bay and within Stoddard Bay. The top 12 inches of the fine fill had the requirement that no less than 40 percent of the material had to pass a 0.075 mm sieve. The purpose of this requirement was to insure sufficient fine material content for good vegetation growth.

Island heights varied for two reasons. First, it is desirable to have the islands decrease slightly in elevation from the upstream to the downstream to insure they overtop at about the same time. This prevents concentration of overtopping flows that could lead to erosion problems. Secondly, varying heights were desired to create different habitat conditions for vegetation. For example, the upper portion of Island W1 is 2-feet higher than Island W4. Different vegetation communities should develop on the islands because of these elevation differences.

The interior and exterior edges of the islands consist of sand berms constructed to above normal summer water elevation. These sand berms are designed to be sacrificial in the sense that some reshaping is expected, as wave action will reshape this material and create a stable beach zone. Erosion of the islands is controlled by rock groins. The end result should be a relatively stable scalloped shoreline.

Rock bank protection was used to protect the ends of the islands. For those island ends more exposed to erosive forces and for the connections with the rock sills, a round end design was used. A round end design was used on Islands W1, W2 (partially), C2 (partially), C8 and N8. A flat end design was used on N2 and N7. Sand tips were added to all remaining flat end island designs. The flat end design is more economical, the trade-off being that it is not as effective as the round end design in preventing erosion on the back side where the rock protection ends. The trade-off was considered acceptable in these locations because they are well protected sites.

Under an earlier design, Island C2 had an upper leg. To reduce costs, this upper leg has been replaced by three small rock mounds (C2a, C2b, C2c) similar in design to seed Islands N3-N6. The only difference is that in this area, the accretion of sand behind the rock mounds is expected to be minimal. The only "islands" that will form will be sand placed on the downstream sides of the rock mounds and subsequently shaped by river flows.

Rock Sills

The rock sills were designed to complement the islands in reducing flow for overwintering fish habitat. Since the entire complex will be overtopped at certain times by high water, the rock sill was designed with a lower top elevation than the islands to serve as a hard point for initial overtopping. This should minimize erosion potential on the islands from overtopping flows. Rock sills were designed for Islands N1, N8, C2 and C8.

The rock sills were designed with various top elevations, ranging from 630.8 to 632.5. The sills are designed to be overtopped by the 50-percent chance (2-yr) event. The purpose is to allow high water events to flow through and promote the scouring of fine sediments from the bay.

Seed Islands

It has been observed in locations where accretion of sediment behind the island would be expected to result in the natural formation of islands. Therefore, four small rock berms, or "seed islands" were placed perpendicular to the direction of flow in the Three North area (N3-N6). Three additional seed islands were placed in the Central island complex (C2a, C2b and C2c). To accelerate the natural formation of islands, sand was placed on the downstream and upstream sides of the rock berms. River currents will reshape the sand into more natural appearing sand spits.

The seed islands were sited using the following consideration:

a. They were located in shallow water to minimize rock requirements.
b. They were located with large shallow areas on the downstream side to promote island formation as rapidly as possible.
c. They were located where they could maintain or stimulate the growth of channels through this area to improve bathymetric diversity.
d. They were located with one end adjacent to deeper water to facilitate construction access with little or no dredging.

Construction History

The scope of the project required multi-year construction. Due to the location and nature of the construction, nearly all of the work required use of marine equipment. Construction of this type is limited to the open water season on the Upper Mississippi River.

STAGE 1

The contract for the Pool 8 Islands Phase III Stage 1 project was awarded in July 2006 to Holte Construction, 3174 Ryan Lane, Little Canada, MN 55117. The project was subcontracted among two companies: Portable Barge Service, Inc., P.O. Box 156, Newport, MN 55055 and Kule Region Forestry, Inc., P.O. Box 3481, La Crosse, WI 54602. Final Construction contract costs were $771,000.00.

Construction began in August 2006 and was substantially complete 14 September 2006. Some supplemental plantings occurred in 2007. The final project close-out occurred 1 August 2007. The contractor had to overcome the shallow water levels for Marine equipment. They overcame this constraint by "Light Loading" their material barges.

STAGE 2a

All construction for the Pool 8 Phase III Stage 2a project was completed by the U.S. Army Corps of Engineers Maintenance and Repair Section out of Fountain City, Wisconsin. . Construction began in June 2007 and was completed September 2008. The final in-house material and labor costs were $339,000. Some areas have needed repair due to backchannel cutting thru this narrow island. Additional design and repair (rock) may be required in the future.

STAGE 2b

The contract for the Pool 8 Phase III Stage 2b project was awarded 8 August 2007 to L.W. Matteson, Inc., #1 South Point, P.O. Box 667, Burlington, IA 52601. The project was subcontracted among two companies: Weymiller Marine, Inc., 800 South Front Street, Lansing, IA 52151 and Sodko Inc., P.O. Box 648, Spring Grove, MN 55974. Final Construction contract costs were $10,329,468.77.

Construction began 17 March 2008 and was substantially complete 12 August 2010. The final project close-out occurred 12 August 2010. The contractor had to overcome some obstacles such as working within a closed area (demob from site by 30 Sept each year). Also, there was a sharp rise in off-road diesel fuel which impacted their bottom their operational costs. The contractor overcame these constraints by working longer hours and weekends.

STAGE 3a

The contract for the Pool 8 Islands Phase III Stage 3a project was awarded to Portable Barge Service, PO Box 150, Newport, MN 55055. The project was subcontracted among two companies: Weymiller Marine, Inc., 800 South Front Street, Lansing, IA 52151 and Sodko Inc., P.O. Box 648, Spring Grove, MN 55974. The final Construction contract costs were $4,862,280.64.

Construction began in June 2009 and was completed in July 2011. The contractor had to overcome some of the same obstacles as the Stage 2b contractor such as working within the closed area (demob from site by 30 Sept each year). Also, there were high water levels in 2010 which delayed some portions of work.

In addition the contractor performed some dredging in a sensitive mussel area without getting prior approval from the permitting agencies and the FWS. Finally the initial willow plantings in the fall were less than successful due to long storage.

STAGE 3b

The contract for the Pool 8 Phase III stage 3b project was awarded to JF Brennan Co Inc., 820 Bainbridge Street, La Crosse, WI 54602. The project was subcontracted among two companies: McHugh Excavating and Plumbing, Inc, W 7010 Evergreen Way, Onalaska, WI 5460 and Sodko Inc., P.O. Box 648, Spring Grove, MN 55974. Final Construction contract costs were $3,395,000.

Construction began in May 2010 and was completed in June 2012. The contractor had to overcome some of the same obstacles as the Stage 3a contractor such as working within the closed area (demob from site by 30 Sept each year).

TOTAL PROJECT CONSTRUCTION COSTS

The total project cost for all five stages was $19,707,749.41

PART II – OPERATION AND MAINTENANCE

GENERAL RESPONSIBILITIES AND PROCEDURES

General

Upon completion of construction, the U.S. Fish and Wildlife Service would accept responsibility for the project in accordance with Section 107(b) of the Water Resources Development Act of 1992. The operation and maintenance responsibilities of the U.S. Fish and Wildlife Service are addressed in the Memorandum of Agreement for the project (attachment B).

Specific operation and maintenance requirements would be defined in project operation and maintenance (O&M) manuals, which would be prepared by the Corps of Engineers, and coordinated with the U.S. Fish and Wildlife Service.

District Manager

Typically, the USFWS operation and maintenance responsibility for habitat projects located within the Refuge is given to the District Manager in charge of the Refuge District where the project is located. For the Pool 8 Islands Phase III project, the current address for the District Manager is 555 Lester Avenue, Onalaska, Wisconsin 54650. Hereafter, for purposes of this manual, when describing responsibilities, etc., the term “District Manager” will be used.

Inspections

The District Engineer or his representative will be kept informed on operation and maintenance activities for the Pool 8 Islands Phase III project through periodic inspection of the project by the Corps and through review of an annual report submitted by the USFWS. A representative of the Corps will coordinate the periodic inspection in advance with the USFWS. The first inspection will occur within 5 years after project completion. Subsequent inspections will occur at 5-year intervals. After the first 10 years of project operation, the Corps and the USFWS will jointly review the inspection plans and make any appropriate revisions.

The findings of the periodic inspections will be transmitted to the USFWS and could include recommendations for any remedial work considered necessary to maintain the habitat project in a satisfactory condition. Any agreed upon remedial work should be completed as soon as possible by the USFWS as provided in the Memorandum of Agreement between the USFWS and the Corps.

An inspection of the project should be made by the District Manager (or a designated representative) once a year as a minimum. The frequency for inspection will be subject to review by the USFWS and Corps and could change upon mutual agreement of both parties. The timing of the inspection can be made at the discretion of the District Manager. No special inspections are required after high water events as they occur on an almost annual basis. The annual inspections should be sufficient to reveal any problems or damage caused by high water events.

Annual Report

An annual report covering inspection of the habitat project shall be submitted to the St. Paul district, attn: Construction-Operations Division, at the end of the calendar year. The report should briefly summarize the condition of the project and any maintenance or repairs required during the reporting period.

OPERATION

There are no specific operational requirements associated with any of the project features that would be the responsibility of the U.S. Fish and Wildlife Service.

MAINTENANCE

The U.S. Fish and Wildlife Service will perform maintenance on the project as necessary for it to remain functional. The estimated average annual operation and maintenance costs for the U.S. Fish and Wildlife Service maintained portion of the project are as follows:

Feature	O&M Cycle	Average Annual Cost
a. Rock replacement	10-yr	$18,200
b. Periodic inspections	5-yr	$1,735
c. Annual inspections	1-yr	$2,500
Average annual amount		**$22,435**

The average annual costs are shown in September 2001 price levels.

Not all project features will require maintenance. Critical features are those that must be maintained for structural integrity or for the feature to provide the majority of the habitat benefits for which it was designed. Non-critical features are those where minor change is acceptable and the need for maintenance will be considered on a case-by-case basis. Dynamic features are those where river forces will be allowed to shape the features with no future maintenance anticipated. Project features categorized by level of expected maintenance are as follows:

Critical – Must be Maintained or Repaired

Rock sill tie-in points with islands
Rock end protection
Rock groin or vane tie-in points with islands
Major damage and/or removal of woody growth at rock sills

Non-Critical – Maintained or Repaired if Determined Necessary

Individual rock groins or vanes
Island shorelines
Rock seed islands
Minor damage to rock sills

Dynamic – No Maintenance

Mudflats
Sandflats
Sand tips on islands
Sand placed on seed islands
Wooden habitat structures
Borrow sites
Access channels

Inspections, Tests, and Operations Following Major Storms or Floods

As stated in the Memorandum of Agreement between the USFWS and the Corps, the Corps will be responsible for any mutually agreed upon repair and rehabilitation of the Pool 8 Islands Phase III project that may be needed as a result of a specific storm or flood.

Should inspection of the project area following a major flood or natural disaster disclose substantial damage to the project, the Corps and USFWS will meet and discuss the appropriate course of action in light of original project design. The options of rehabilitation or abandonment of the project may

be considered at this time. Any decision would be carried forth only upon written mutual agreement of the USFWS and the Corps. Included within such agreement would be a description of the agreed upon course of action and funding responsibilities, if any.

Project Monitoring and Evaluation

Performance monitoring of the Pool 8 Islands Phase III project will be conducted by the Corps of Engineers and other state and federal partners to help determine the extent to which the design meets the habitat improvement objectives. See Appendix E for additional information. Information from this monitoring will also be used, if required, when ascertaining whether rehabilitation or abandonment of portions of this project would be the wisest choice.