

PEER REVIEW PLAN

Endangered Mussel Conservation - Measures for Managing Zebra Mussels

St. Croix and Upper Mississippi Rivers

Feasibility Study Report

22 April 2008

I. Purpose and Requirements. This Peer Review Plan (PRP) is for the project “Endangered Mussel Conservation – Measures for Managing Zebra Mussels, St. Croix and Upper Mississippi Rivers, Feasibility Report”. The PRP was developed in accordance with EC 1105-2-408, “Peer Review of Decision Documents,” dated 31 May 2005. The EC establishes procedures to ensure the quality and credibility of Corps decision documents. The EC outlines the requirement of the two review approaches (independent technical review (ITR) and external peer review (EPR)) and provides guidance on Corps Planning Centers of Expertise (PCX) involvement in the approaches. It applies to all feasibility studies and reports and any other reports that lead to a decision.

II. Project Description.

A. Study Authority. The study is being conducted under the authority of Section 216 of the Flood Control Act of 1970, which authorizes investigations for modification of completed projects or their operation when found advisable as a result of significantly changed physical or economic conditions and for improving the quality of the environment in the overall public interest. This feasibility study is consistent with the approved Section 905(b) reconnaissance report, which recommended a \$2.2 million feasibility study at full Federal expense to investigate zebra mussel control measures throughout the entire Upper Mississippi and Illinois waterways, including the St. Croix River.

B. Purpose. The overall purpose of the feasibility study is to identify cost effective and environmentally sustainable alternatives for managing zebra mussel populations in the St. Croix and adjacent Upper Mississippi River pools and/or for the conservation of the winged mapleleaf mussel if zebra mussel control is determined to be infeasible or only partially effective. The feasibility study’s level of detail must be sufficient to determine preferred alternatives and to meet the requirements of the National Environmental Policy Act (NEPA) and other pertinent environmental laws.

C. Study Area. The present study will be confined to St. Croix River Basin and adjacent Upper Mississippi pools (pool 2 through 4), Minnesota and Wisconsin.

D. Problems and Opportunities. Zebra mussels (*Dreissena polymorpha*) in the St. Croix and Upper Mississippi River are a significant threat to the continued survival of the Federally-endangered native mussels, Higgins eye pearly mussel (*Lampsilis higginsii*) and winged mapleleaf mussel (*Quadrula fragosa*). The U.S. Fish and Wildlife Service’s final 2000 biological opinion for the operation and maintenance of the Upper Mississippi

River 9-foot navigation channel project concluded that continued O&M, because of zebra mussels, would jeopardize Higgins eye and result in incidental take of winged mapleleaf. This Feasibility Study is required to comply with Section 7(a)(2) of the 1973 Endangered Species Act.

E. Study Scope. A risk-based model is being developed to evaluate the most likely pathway for further zebra mussel invasion, a timeline, estimated long-term population characteristics, sensitive areas for native mussels and other native species which may be impacted by zebra mussels, and potential ecological consequences of zebra mussel infestation. This model would be used to focus the development and evaluation of potential management actions. In the event that zebra mussel management and control is found to be only partially effective, and/or determined to not be feasible, a structured, consistent, and fully transparent decision-making process will be needed to determine triggers and criteria for relocation and/or additional artificial propagation of winged mapleleaf mussels.

Management of zebra mussels in the system may need to include measures to control/manage dispersal of zebra mussels, reduce/manage zebra mussels already present, and prevent future introductions of zebra mussels and/or other exotics such as quagga mussels, and non-native fishes and plants. Alternatives to be studied will include large- and small-scale alterations of the habitat conditions to control or reduce the numbers of zebra mussels, closing portions of the system to recreational and/or commercial traffic, cleaning/coating technologies for commercial vessels and recreational craft, and dispersal barriers to prevent transport of zebra mussels.

F. Budget. There is a sunk cost of \$50,000 in preparing the approved Section 905(b) reconnaissance report. The estimated cost to complete the Feasibility Study is \$2.2 million. It is likely a combination of zebra mussel control and winged mapleleaf conservation measures will need to be implemented including the following: 1). Establishment of new, viable populations of winged mapleleaf out of harms way from zebra mussels (implementation costs \$2 - \$3 million); 2). Habitat modifications and mussel stocking (implementation costs \$15 - \$20 million); and 3). Public outreach and measures to control introduction and dispersal of zebra mussels (to be implemented by the States or others).

The NWW Cost Estimating Directory of Expertise will be asked to review the cost estimate for this project.

G. Project Delivery Team (PDT). The Corps of Engineers St. Paul District and Engineering Research and Development Center – Vicksburg are jointly conducting this study. The U.S. Fish and Wildlife Service, National Park Service, and the States of Minnesota and Wisconsin are collaborating partners. The PDT also includes external experts in the fields of data management and risk assessment modeling. The Corps' project manager is the primary point of contact and can be reached at (651) 290-5433.

Corps PDT:

MVP-ED-D, Cost/Spec Engineering
MVP-ED-D, Geotechnical Engineering
MVP-ED-D, Structures
MVP-EC-H, Hydraulics & Hydrology
MVP-RE, Real Estate
MVP-CT, Contracts
MVP-CO-C, Construction
MVP Public Affairs
MVP-PM-A, Project Manager
MVP-PM-E, Environmental
MVP-PM-E, Environmental
MVP-PM-E, Economics/social
MVP-PM-E, Cultural
MVP-DB, Small Buisness
MVP-PM-E, GIS
ERDC-EL-MS

Vertical Team

MVD-RB-T
MVD-PD-SP
MVD-PD-N
CECW-MVD

Partners:

U.S. Fish and Wildlife Service Twin Cities Field Office
U.S. Fish and Wildlife Service, Fisheries Resources
U.S. Fish and Wildlife Service, Genoa National Fish Hatchery
Minnesota Department of Natural Resources
National Park Service
Wisconsin Department of Natural Resources
University of Minnesota
Great Lakes Indian Fish and Wildlife Commission

Consultants:

E2
URS

III. METHODOLOGY AND MODEL CERTIFICATION

A. Planning Models. EC 1105-2-407 provides the following definition of a planning model:

“any models and analytical tools that planners use to define water resources management problems and opportunities, to formulate potential alternatives to address the problems and take advantage of the opportunities, to evaluate potential effects of alternatives and to support decision-making.”

B. Quantification of Benefits. Models are being developed to assist in the planning and quantification of benefits. Private consultants with expertise in risk assessment models for invasive species will be developing a Risk Assessment Model for zebra mussel invasion of the St. Croix River Basin. Technical experts from the partners and ERDC-EL-MS are providing direct input into the model development and an Independent Technical Review for purposes of model certification. The risk assessment model will be used to evaluate the most likely pathway for further zebra mussel invasion, estimate long-term population characteristics, identify sensitive areas and potential ecological consequences, and identify and evaluate potential zebra mussel management measures.

A Multi-attribute Decision Framework (MDF) for winged mapleleaf (WML) Management is being developed by ERDC-EL-MS in cooperation with the PDT and external experts. The MDF will be used to develop and evaluate management measures for winged mapleleaf mussel conservation if zebra mussel control is only partially effective and/or determined to be not feasible.

Key components of the MDF include:

- 1) Development of scenarios of zebra mussel threats to winged mapleleaf.
- 2) Formulation alternatives from mixes of measure representing optimum performance under different zebra mussel threat scenarios. The measures to be evaluated will include boating restrictions, cleaning of WML, relocation of WML, propagation, constructed refugia, habitat modification, cryogenic preservation, and public awareness.
- 3) Establishment of trigger criteria to determine when conditions have changed from the various scenarios.
- 4) Establishment of metrics or attributes that will guide plan evaluation, including level of in-situ protection, level of removal from threat, economic (initial and O&M), technical reliability, level of induced risk and benefit, reversibility of action, and practicality of implementation..
- 5) The MDF will yield a decision score for each plan that integrates metrics weights and plan performance estimates, thus demonstrating the multi-metric approach to plan evaluation.

Model certification will be required for the risk assessment and MDF. The certification will be conducted by ERDC-EL-MS in coordination with the Ecosystem Restoration Planning Center of Expertise.

C. Cost Effectiveness. Cost effectiveness and incremental cost analyses will be based upon the outputs of the Risk Assessment Model, Multi-Attribute Decision Framework for Winged Mapleleaf Management, and the Institute for Water Resources (IWR) PLAN program.

IV. Review and Quality Control.

A. Independent Technical Review (ITR) Plan. The ITR is the primary method of quality control. ITR review will be ongoing through product development, rather than a cumulative review performed at the end of the investigation. Value Engineering and

External Peer Reviews are integrated into the overall Independent Technical Review at critical points in the planning and review process. These will further assure the quality of the product and enhance the overall ITR. The ITR Team Leader will be from a Corps Division outside of Mississippi Valley Division (MVD), in coordination with the Ecosystem Restoration Planning Center of Expertise.

The ITR team will include at least two people from ERDC – Vicksburg, an expert in risk assessment and an expert in invasive species management. ERDC-EL-MS, will be assisting in the development and application of the risk assessment model. Therefore, it is appropriate to include the two ERDC people designated below on the ITR Team. The expertise and technical backgrounds of the ITR team members will qualify them to provide a comprehensive technical review of the product. Review of cost estimates will be coordinated with the Cost Engineering Center at Walla Walla District.

Many of the specific ITR team members are yet to be identified, but would include the following disciplines:

- ITR Team Leader (Outside of MVD)
- Risk Assessment Models (Dr. Burton Suedel – ERDC-EL-MS)
- Invasive Species Management (Dr. Barry Payne – ERDC-EL-MS)
- Environmental/NEPA
- Cultural Resources
- Hydraulics Engineering
- Structural Engineering
- Cost/Value Engineering (Walla Walla District)
- Operations
- Real Estate

Once PCX endorsement of this plan has occurred, MVD will verify the level of review decision with the HQ vertical team as part of the final approval of the PRP.

B. Value Engineering (VE) Plan. Value Engineering (VE) evaluations provide another method for ensuring quality. The goal of VE on this project is to ensure that a full array of alternatives is considered in order to maximize cost effectiveness. A VE study will be conducted during the plan formulation before the final array of alternatives has been defined. The VE study objectives will be to build upon the design team’s preliminary plan formulation efforts, clarify the functional requirements of project features, and recommend additional conceptual alternatives to meet those requirements. The same team that performs ITR will conduct the VE study with additional technical representatives from the Partners.

C. Other Review. Quality control will also be monitored via internal/District functional element reviews, public meetings, partner and stakeholder reviews, and higher authority/vertical team conferences and reviews.

D. Review of Sponsor Deliverables. The study has no local Sponsor or deliverables.

E. External Peer Review Plan. A decision whether to conduct a Peer Review for this project has not been made at this time, due to considerable uncertainty regarding whether the criteria for a Peer Review will be met by the project recommendations which come out of the feasibility study.

“The Mississippi River Between the Missouri River and Minneapolis, 9-Foot Channel Project – Measures for Managing Zebra Mussels Reconnaissance Report” (Recon Report) was completed in August 2003. In the Recon Report, the study area was the 9-Foot Channel in the Upper Mississippi River System (UMRS), which includes the St. Paul, Rock Island and St. Louis Corps Districts. The study area has since been significantly reduced in geographic scope, and now includes only the St. Croix River Basin and adjacent Upper Mississippi River Pools 2-4, Minnesota and Wisconsin.

In the Recon Report, it is stated that “...a preliminary draft feasibility report and Environmental Impact Statement (EIS) will be prepared and reviewed by an Independent Group, with no vested interest in the outcome of the study. Based on the review by the Independent Group, a draft feasibility report and EIS will be prepared.” Note that the current requirements for Peer Review did not exist when the Recon Report was published.

There is considerable uncertainty at this time which alternatives for zebra mussel control will be recommended, or may ultimately be implementable. Because of this, and because of the significant reduction in geographic scope, the decision as to whether or not an EPR will be performed on this study has not been made. It is also not certain that an EIS is needed, as opposed to an Environmental Assessment. The Vertical Team and the Ecosystem Center of Expertise will be engaged during the consideration of these decisions.

The feasibility study has recently begun and information needed to determine whether or not an EPR and an EIS are necessary is not available at this point. This decision will be revisited during the Feasibility Scoping Meeting (FSM) tentatively scheduled for 1st Quarter – FY2009 when more information regarding project risk and magnitude are known. A revised Peer Review Plan including the District’s recommendation on the EPR and EIS decisions will be provided with the FSM documentation

F. Process. ITR comments and responses will be recorded, and documentation of the ITR will be included with the submission of the reports to Mississippi Valley Division and HQUSACE. All comments resulting from the independent technical review will be resolved prior to forwarding the feasibility study to higher authority and local interests. The report will be accompanied by a certification, indicating that the independent technical review process has been completed and that all technical issues have been resolved.

G. Public Review. The St. Paul District will pursue public involvement during at least two project periods. The first will be public/stakeholder scoping meetings during alternatives formulation (see section V. Schedule). The second period of public and

stakeholder meetings will be held during the review period when the Environmental Impact Statement is available to the public. The draft Feasibility Study Report and environmental impact statement will be distributed for public review as part of the normal NEPA review process. The formal public review will be scheduled after the Alternative Formulation Briefing and before submitting the report to the Civil Works Review Board in accordance with the study schedule defined in section V. Schedule.

The public will have the opportunity to comment on the draft Feasibility Report and environmental documentation at the public meetings and during the public review comment period. Any significant or relevant public comments will be provided to reviewers.

V. Schedule. The schedule for study tasks related to review and public input are shown in the following table:

ID	Task Name	Duration	Start Date	Finish Date
1	Start Project	0 days	2-Mar-06	2-Mar-06
5	Public NEPA Scoping Meeting	3 day	1-Jun-09	4-Jun-09
11	ITR & EPR Review & VE Study	4 wks	18-Oct-09	15-Nov-09
12	Feasibility Scoping Meeting	4 wks	7-Dec-09	7-Jan-10
20	ITR Review	4 wks	20-Jan-10	19-Oct-10
22	Alt. Formulation Briefing	4 wks	2-Nov-10	2-Dec-10
25	Public meeting (local)	3 day	30-Jul-11	5-Aug-11
28	HQUSACE policy review	4 wks	17-Sep-11	14-Oct-11
29	CWRB briefing	1 day	15-Oct-11	15-Oct-11
30	Agency and Public Review	6 wks	23-Oct-11	3-Dec-11

Bold font designates Major Milestones.

VI. More Information. For more information about this study, please contact the project manager at (651) 290-5433.

More information on this study, including available documents associated with this study, can also be found at the following links:

- <http://mvp.usace.army.mil/environment>
- <http://el.erdc.usace.army.mil/ecocx/corps.html>