Widlak 1993

United States Department of the Interior
FISH AND WILDLIFE SERVICE
446 Neal Street
Cookeville, Tennessee 38501

TAKE PRIDE IN AMERICA

FAX COVER SHEET

TO: DR. RICHARD NEVES

ATTENTION:

RECEIVER'S FAX NUMBER: 703/231-7580

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SUBJECT: PROPOSAL FOR MUSSEL RELOCATION STUDY & RELOCATION CONTINGENCY PLAN.

ANY COMMENTS OR RECOMMENDATIONS WOULD BE APPRECIATED

DATE: 14 JUL 93 TIME: 7:35 (CST)

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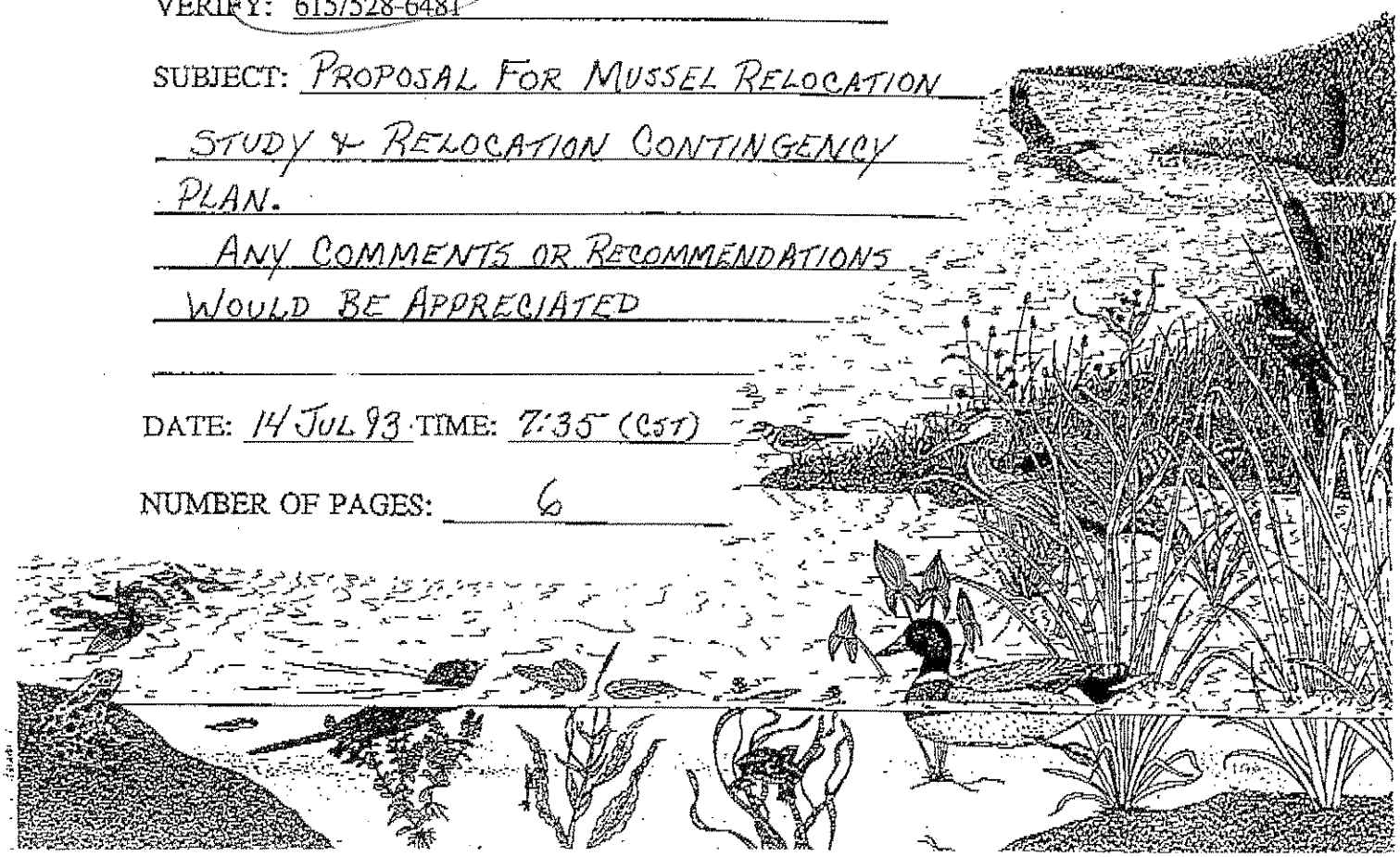

PRELIMINARY DRAFT

MUSSEL RELOCATION AND CONTINGENCY PLAN

I. Introduction

In January, 1993, the U.S. Fish and Wildlife Service issued a biological opinion regarding the effects of the Olmsted Locks and Dam project on six species of endangered freshwater mussels. Included in the opinion were eight reasonable and prudent measures to be implemented by the U.S. Army Corps of Engineers, Louisville District. Thus far, the Louisville District has completed or initiated the implementation of the first six measures. The preparation of this "Mussel Relocation and Contingency Plan," represents the first formal step in implementing the last two measures. It follows numerous telephone discussions and several meetings between Drs. Andrew Miller and Barry Payne, Waterways Experiment Station (WES), Vicksburg, Mississippi, Jim Widlack and Doug Winford, U.S. Fish and Wildlife Service (USFWS), Cookeville, Tennessee, and Mike Turner, Louisville District office (LDO), Louisville, Kentucky.

II. Reasonable and Prudent Measures

The last two measures contained in the biological opinion are reproduced as follows for easy reference;

7. As a last resort, if all corrective measures to avoid adverse impacts to the mussels or their habitat fail, the Corps will relocate mussels from the impacted area to a suitable site that will not be affected by project-related activities. Within six months of the date of this Biological Opinion, the Corps will develop a contingency plan for relocating the mussel resource. The plan will describe in detail how mussels will be collected and transported, and the site or sites to which they will be moved. The draft plan will be submitted to the Cookeville Field Office and to the Kentucky Department of Fish and Wildlife Resources for review and approval. The approved plan will be periodically updated to include findings from a mussel relocation study (See Reasonable and Prudent Measure #8). Mussels may be relocated, if necessary and as a last resort, in accordance with provisions of the contingency plan at any time during construction, provided that the latest findings of the relocation study have been incorporated into the plan.

8. Since past relocation efforts in the Ohio River and other systems have resulted in unacceptable mortalities of mussels, it should be demonstrated, prior to relocation of endangered species, that mussels can be successfully relocated. Therefore, the Corps will initiate a mussel relocation study prior to project commencement. The study will test the contingency plan described in Reasonable and Prudent Measure number 7, and will document the

success of the test mussel relocation effort. The Corps will prepare a detailed that outlines how mussels will be collected and transported, and identifies the site or sites to which they will be moved. The draft plan will be submitted to the Cookeville Field Office and to the Kentucky Department of Fish and Wildlife Resources for review and approval (See Reasonable and Prudent Measure #7). Non-endangered species should be collected from the mussel bed downriver from Lock and Dam 53 and moved to the selected relocation site(s). These mussels should be monitored throughout the project construction period to determine survival and, if possible, reproduction. Annual findings and results of this study should be provided to the Cookeville Field office and the Kentucky Department of Fish and Wildlife Resources.

III. Contingency Plan

The Louisville District has developed a contingency plan to address the possibility of certain circumstances threatening the downstream mussel bed.

1. Should physical monitoring reveal that movement of bed load materials, most probably in the form of a sand wave, is threatening the downstream mussel bed, the Corps of Engineers would attempt to intercept such bed load movement and remove it by dredging prior to its passage over the mussel bed.

2. Further, should it be determined that sand waves, sedimentation on the mussel beds, or other environmental problems, e.g., unanticipated changes in velocities and current patterns, are attributable to project construction, the Louisville District is committed to solving any problem, even to the point of suspending the offending construction activity until a solution can be found.

3. The Louisville District is presently studying minor modifications, i.e., different lengths, of the cofferdam's upstream deflector wall which will move upstream the scour hole that is expected to form as a result of the construction of each of the cofferdams. At present, the scour hole for the first stage cofferdam would form on the dam's axis. Any change in deflector wall length will be designed to move the area of scouring upstream away from the dam's axis and consequently will increase the distance between the scour hole and the downstream mussel bed. Further, the District is planning for dredging of the area expected to scour prior to the creation of conditions that would cause such an event. This is intended to remove material that would otherwise be scoured and redeposited by the river.

4. As regards the sediment monitoring equipment being installed at the downstream mussel bed, the Cookeville Field Office will have 24 hour access via telephone modem and a dedicated line to data collected by the equipment. The Cookeville Field Office will be notified of sediment accumulations or erosion and consultation reinitiated in accordance the provisions of reasonable and prudent measure #1.

zebra

5. Finally, and only as the measure of last resort, the Louisville District would undertake efforts to salvage and relocate mussels, especially endangered species, upon the determination that project related impacts cannot be mitigated by any other means, e.g., a reduction in the rate or period of dredging. Certain criteria that need to be met in the event of an actual relocation are described in Section V. Mussel Relocation Plan.

IV. Mussel Relocation Study - 1993 WES Scope of Work

The mussel relocation study presented herein is taken from the scope of work for biological monitoring previously coordinated between WES, ORL, and USFWS.

Study Plan. The purpose of this study will be to investigate methods of relocating mussels and attempt to reduce mortalities should relocation be necessary. There will be two components of this task. First, WES will review results of all previously used methods. The WES will then initiate relocation of non-endangered mussels as part of the project. Demographically complete populations of three species of common mussels (Fusconaia ebena, Lampsilis ventricosa, and Quadrula pustulosa) will be collected during other quantitative and qualitative studies by WES. Specimens will be marked with an identifying number using a dremel tool and held in the river until needed. Three sites will be located on the mussel bed downriver of Lock 53 for this work. Sites will be chosen that are free of excessive sedimentation and erosion. An appropriate number of aluminum quadrats will be secured to the river bottom and all existing substratum (including sand, gravel, live mussels, and Corbicula fluminea) will be removed. Marked mussels will then be replaced in the enclosure. The locations of these replacement sites will be identified with a GPS.

sites not likely (flow) to be affected by zebras

Around the outside of each quadrat, divers will place 5-10 sediment collectors. These are constructed from PVC pipe and are approximately 6 inches high and 4 inches in diameter. The collectors have a coarse screen on top (1/2 inch mesh) and a solid bottom. Prior to use the collector will be filled with coarse gravel (1-2 inches in diameter). After one year in place the collectors will be obtained by divers and distribution of grain sizes measured. This will provide some information on the movement of sands and silts at the sites where the relocation experiments are conducted.

In future study years, these sites will be located and divers will find the exclosures. Divers will make observations on the nature of the river bottom and the exclosures (and associated cables and iron poles used to secure the exclosures) to determine if they have been affected by excessive sedimentation or erosion. All of the mussels and sediments within each exclosure will be excavated and brought to the surface. Marked and unmarked mussels will be weighed and measured. Marked mussels will then be replaced

in the substratum. Sites will be visited each year and the process repeated. If mussels are lost due to erosion or mortality new mussels will be marked and placed in the exclosures.

It should be noted that this method cannot distinguish between mussels that were removed from the exclosure by erosive action of water, and mussels that died in place and their shells were removed. However, the number of mussels that enter the exclosure from upriver (and would be unmarked) can be determined. The amount of successful reproduction from the relocated mussels cannot be determined since young mussels are likely to be carried into the exclosures from upriver.

Females can by checked for gravidity

Results will be analyzed each year and described in the final report. Recommendations will be made on methods for successfully relocating uncommon or endangered species of mussels if required.

Data Analysis. Collecting data using the previously described methods will allow WES to make three types of comparisons:

1. Within mussel beds (nearshore versus farshore and upriver versus downriver);

2. Between mussel beds (comparing conditions at one mussel bed with conditions at another mussesl bed; and,

3. Among study years (studying the same bed through time).

Baseline data (collected in 1992 and previously), will be used to document such parameters as density, species diversity, evidence of recent recruitment, and relative abundance of P. cooperianus. The results of subsequent studies (1993 and beyond) will be used to determine if negative effects are occurring.

Schedule. Field studies will be completed during a low-water period in July-October of each study year. The 1993 studies will be initiated in mid-August. A brief report, to include a summary of field activities, will be sent to the District within 30 days of completion of the fieldwork. A draft report, that includes a detailed discussion of methods and results, will be completed by March, 1994.

V. MUSSEL RELOCATION PLAN

In the event that circumstances dictate that relocation occur, the following suggested plan is offered.

Suggested Relocation Plan (aka, "The Prime Directive")

Site Selection

1. Any relocation of mussels will be to existing healthy beds with similar substrate.

Specific sites?

Other considerations; (a) Similar species composition and fisheries are also desirable characteristics, i.e., the greater the number of similarities the greater the prospect of a successful relocation. (b) Sites within the historical range of an endangered species and outside the known or anticipated range of the zebra mussel should be given first consideration; however, sites which may represent a range extension should be considered if necessary to preserve the species.

2. Exact locations(s) for the placement of any relocated mussels will be determined in consultation with the USFWS and with the participation of Kentucky Department of Fish and Wildlife Resources (or any other state's resource agency(-ies) as may be necessary).

Other considerations; (a) Selected sites should be designated mussel sanctuaries by the state(s). (b) All other administrative or regulatory mechanisms for protection of relocation site(s) should be investigated and implemented, if beneficial to the resource. (c) Serious consideration should be given to multiple relocation sites (probably 2, maybe 3) if enough endangered mussels with reproductive potential can be collected.

Mussel Collecting

3. Collecting of mussels may be accomplished by a variety of methods;

(a) WES and LDO biologists, working with TVA divers, collect, identify, and sort (according to priority for relocation) an agreed number of mussels. Other agency biologists and divers (subject to CE diving regulations?) supplement CE efforts. (I envision this being similar to the fish study of a Lake Barkley embayment done a number of years ago.)

(b) Invite local licensed musselers to brail the bed. Government biologists get all endangered species and first choice of 25% of nonendangered species for relocation. Musselers may retain remainder for commercial purposes. All mussels not suitable for commercial purposes are either returned to the river or released to government biologists.

KDFWR approval needed

(c) Invite commercial mussel divers from other states to operate in same or similar manner as (b). Certain state restrictions or licensing requirements may have to be met or modified. This has the potential for being the fastest method to collect mussels.

(d) Dredge mussels in some manner to be determined. Commercial dredging of mussels was performed in the past. Note; WES was, at one time, considering studying this methodology. Drew or Barry will have to expand on this idea.

(e) Use any one or combination of the above over several years.

Mussel Handling

4. Each and every mussel collected for relocation shall have its exterior shell examined, washed, and scraped, preferably at the collection site, to remove any attached organisms, most especially zebra mussels. Priority for relocation should be given to the healthiest individuals with the most reproductive potential.

5. All relocated mussels will be quarantined. It is imperative that each and every native mussel must be certified free of zebra mussels and velligers prior to relocation in order to avoid introduction of zebras along with the native molluska.

Note: I expect that this will need to be in a laboratory setting, possibly at WES, TVA, USFWS, LDO, one or more states, or some combination thereof. Quarantine standards will need to be developed.

Mussel Relocation

6. Any relocation of P. cooperianus should also consider the placement of individuals in close proximity to enhance potential for future reproduction.

7. All endangered species, as well as possibly other mussels, should be identified (marked, tagged, etc.) before placement in new location. Measures to prevent loss of endangered species should be considered (e.g. placement in baskets).

Monitoring of Relocated Mussels

8. The Corps of Engineers will continue to monitor any relocations in the same or similar manner as the existing mussel beds.