

# SOIL & WATER



## CONSERVATION

### Columbus County Soil and Water

#### Conservation District

45B Government Complex Road - Whiteville, NC 28472

(910) 642-2196 ext. 3

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#### Stream Debris Removal Contractors:

Notice is hereby given that the Columbus Soil & Water Conservation District is soliciting contractors and professional firms to perform the removal of stream debris in **Weymans Creek**. This bid packet is considered **Weymans Creek; Section 1**. The planned work area is approximately 68,572 feet beginning at its outlet on the Cape Fear River and continuing to where Weymans Creek crosses Old Lake Road near 11500 Old Lake Road. This planned work area is referenced on the attached Project Map.

Please reference the following important documents:

- Project Map
- Scope of Work
- Woody Debris Removal Guidelines titled "Incremental Effects of Large Woody Debris Removal on Physical Aquatic Habitat".
- Project Bid Sheet

The Scope of Work describes the State requirements for receiving payment for completed work. The Columbus Soil and Water Conservation District will be the Contracting Officer for this project however you should reference the contract to understand how the payment process works and note other items that will be required should you be awarded the contract.

Work must be completed according to the Woody Debris Removal Guidelines, starting on page B-1 of the attached document titled "Incremental Effects of Large Woody Debris Removal on Physical Aquatic Habitat". Columbus Soil & Water Conservation District will require that the debris removed be placed a minimum of 20 feet from the edge of the stream and on the same side that it originated.

All bids must be on the attached Project Bid Sheet and shall clearly state the total price for completing the contract, NOT a price per foot. Lengths referenced in this notice and on the Project Map are approximate and will not be used to determine payment or project completion.

Time Frame – Target Start Date – July 15, 2019  
Project Completion Deadline – November 30, 2019

Project Bid Sheets must be received by 5:00 pm on Friday, June 14, 2019. Send project bid sheets to, Columbus Soil and Water Conservation District, 45B Government Road, Whiteville, NC 28472. Please include copies of reference letters or other documentation of prior work experience. Bid opening will take place at the District Office at 8:00 AM on Monday, June 17, 2019. Questions should be directed to Edward Davis at 910-642-2196, ext. 3.

## **SCOPE OF WORK STREAM DEBRIS REMOVAL PROJECT**

The CONTRACTOR awarded this project shall be required to submit a construction schedule showing the sequence of all work to be performed.

The CONTRACTOR awarded this project will complete stream debris removal activities including cutting and removing downed trees, broken tops, and woody debris that impede or potentially impede water flow in the streams and tributaries described in the application submitted by the CONTRACTOR.

The CONTRACTOR awarded this project shall be required to have a one million-dollar (\$1,000,000.00) liability insurance policy in effect throughout the term of the Contract.

The CONTRACTOR awarded this project shall furnish a performance bond payable to the Columbus County Soil and Water Conservation District and conditioned upon the CONTRACTOR faithfully performs the conditions of the Contract. Said bond shall be in the amount of the total bid for the Contract. The surety on the bond shall be a duly authorized corporate surety company authorized to do business in the State of North Carolina.

The CONTRACTOR will ensure that all required permits are secured for each site before any work proceeds for that site.

The CONTRACTOR will ensure that it follows the Woody Debris Removal Guidelines to manage all woody debris removed from streams. These guidelines can be downloaded at <http://www.ncwater.org/FinancialAssistance/Minimum%20Criteria%20-%20Incremental%20Effects%20of%20LWD%20Removal%201992.pdf>

The CONTRACTOR awarded this project will complete stream debris removal activities by cutting and removing downed trees, broken tops, and woody debris. Woody debris 18 inches in diameter and less shall be cut in lengths of at least 10 feet unless other arrangements are made with the inspecting officer.

### **REPORTING**

The CONTRACTOR will submit written, weekly progress reports, with each report due before 9:00 am each Tuesday, continuing until the project is complete and final project report is approved. The weekly progress report is required even if no activity has occurred for the week and no reimbursement is requested for the week.

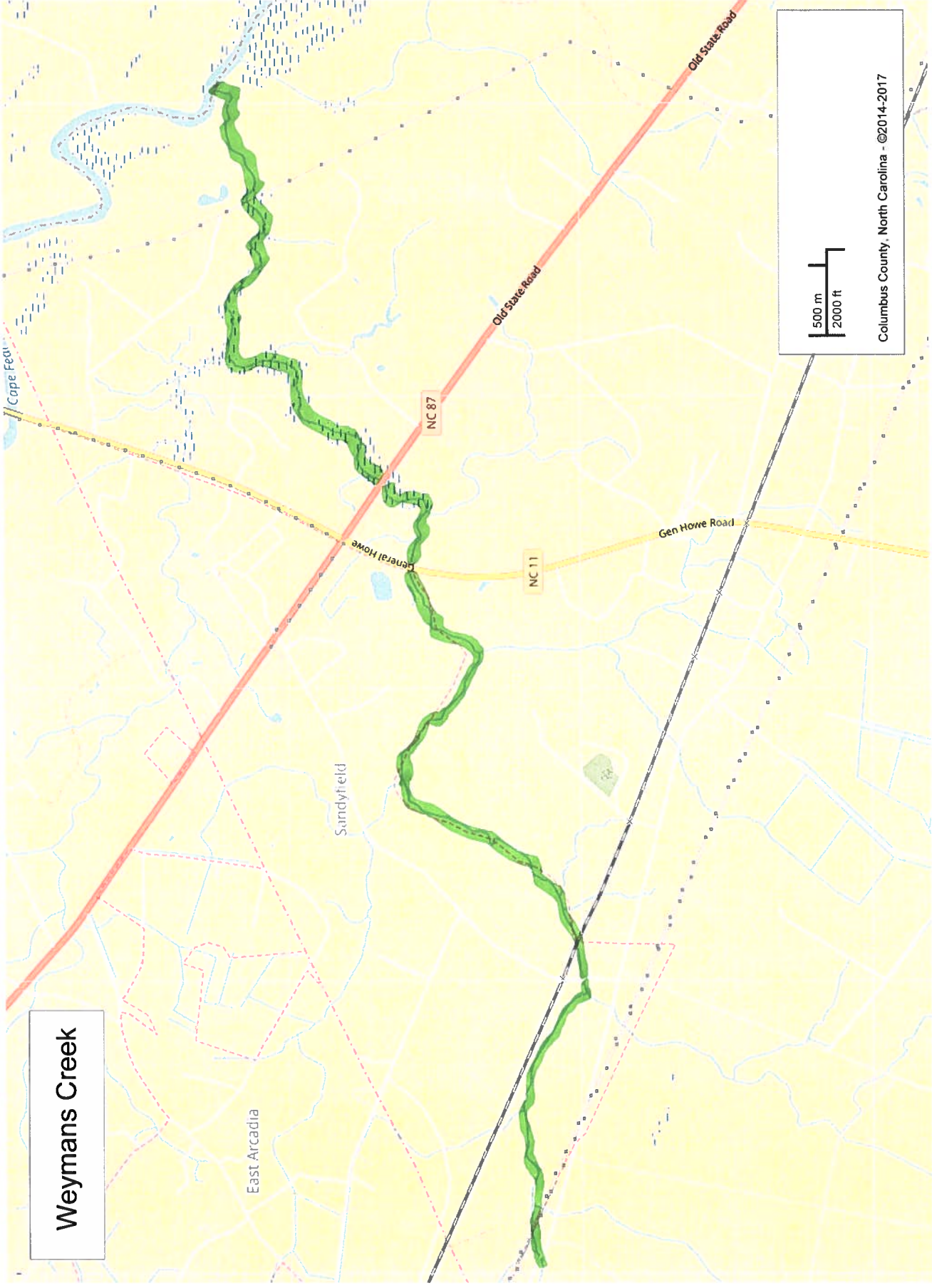
The weekly and final report shall include a narrative summary of the work completed each week and for the project to date and a summary of cash and in-kind expenditures for the week and total project. Although the CONTRACTOR is not required to provide cash nor in-kind match for the project, the report should also include the total cash and in-kind match contribution provided by the CONTRACTOR.

### **INVOICING and PAYMENTS**

The CONTRACTOR shall submit a monthly invoice on the Stream Debris Removal Project Invoice Form indicating total cash and in-kind expenditures for the month and for the total project and indicating the amount requested for reimbursement each month.

Ten percent (10%) of the contract amount will be withheld until all final work is complete and all reports and work has been satisfactorily completed.

Staff from the Division of Soil and Water Conservation or its designated agent will conduct a site visit and approve the work completed and submitted for reimbursement prior to releasing any payment to the CONTRACTOR. The Division must satisfactorily determine that all work has been completed in accordance with the Woody Debris Removal Guidelines.



Weymans Creek Est. 68,572 L. Ft.

# Project Bid Sheet

**Bid Area**

**Weymans Creek; Section 1**

**Est. Footage**

**68,572 L Ft**

**Bid**

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- Estimated footage is given for reference only and will not be used to issue payment by.
- Please include references or any other pertinent documentation.
- Also, please include prior work experience, number of crews available to complete the work and the type of equipment readily available for use to complete this debris removal work.

Contractor's Name: \_\_\_\_\_

Contact Person: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

Phone: \_\_\_\_\_

Prior Work: \_\_\_\_\_

\_\_\_\_\_

Number of Crews: \_\_\_\_\_

Equipment Available: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Notes/Comments: \_\_\_\_\_

\_\_\_\_\_

Signature: \_\_\_\_\_



US Army Corps  
of Engineers



ENVIRONMENTAL IMPACT  
RESEARCH PROGRAM

TECHNICAL REPORT EL-92-35

INCREMENTAL EFFECTS OF LARGE WOODY DEBRIS  
REMOVAL ON PHYSICAL AQUATIC HABITAT

by

Roger H. Smith

Center for River Studies  
Memphis State University  
Memphis, Tennessee 38152

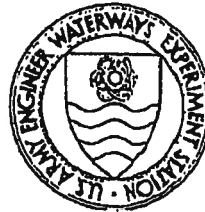
F. Douglas Shields, Jr.

USDA Agricultural Research Service  
National Sedimentation Laboratory  
Oxford, Mississippi 38655-1157

Elba A. Dardeau, Jr., Thomas E. Schaefer, Jr., Anthony C. Gibson

Environmental Laboratory

DEPARTMENT OF THE ARMY  
Waterways Experiment Station, Corps of Engineers  
3909 Halls Ferry Road, Vicksburg, Mississippi 39180-6199



November 1992

Final Report

Approved For Public Release; Distribution Is Unlimited

Prepared for DEPARTMENT OF THE ARMY  
US Army Corps of Engineers  
Washington, DC 20314-1000

Under EIRP Work Unit 32555

## PART V: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

### Summary

LWD plays an important role as a component of aquatic habitat. Although LWD enters food webs as it decays, the major importance of debris lies in its structural characteristics and the way it influences channel flow patterns. Physical processes associated with debris in streams include the formation of pools and retention of fine sediment and organic matter.

Awareness of the adverse effects of complete LWD removal on channel stability and aquatic habitat has led to the development of guidelines for selective removal of LWD as a means of balancing habitat and conveyance objectives. These guidelines (Appendix A) involve the use of manual labor and small equipment to remove only the LWD that causes significant flow obstruction. Removal of bank vegetation and disturbance to stream habitats is minimized. Personnel within some Corps districts have already completed or are in the process of classifying the streams under their jurisdiction according to these guidelines. Use of these guidelines for project planning and design requires quantification of the hydraulic and environmental impacts of incremental LWD removal.

In this study, a simple method for quantifying LWD density and computing associated friction factors was developed and tested using data collected during an LWD removal project on the South Fork Obion River in western Tennessee. Physical conditions of both cleared and uncleared stream reaches were measured by collecting three types of data: LWD density, dye tracer tests (for computing reach mean hydraulic parameters), and physical habitat (depth, velocity, bed type, and cover) at selected transects. The LWD density was the important independent variable, while the dye tracer and physical habitat data were used to study macroscale and microscale effects of LWD, respectively. Macroinvertebrate samples were also collected at low flow conditions, and the results are presented in a companion report to this study (Payne and Miller in preparation).

### Conclusions

Removal of LWD from the study reach decreased near-bank-full friction factor by about one third. Impacts on physical aquatic habitat at base flow

were measurable and statistically significant, even though the Stream Obstruction Removal Guidelines (IAFWA 1983) were applied throughout project planning and implementation. Benefits of proposed LWD removal projects should be carefully analyzed in light of costs and environmental impacts. Findings of this study generally agreed with work by others in different types of streams. The simple procedure developed in this study for quantifying LWD density and its effect on channel resistance may be used for environmental impact assessment and hydraulic engineering analyses. Considerable refinement and site-specific adaptation may be in order, however. The method for prediction of channel roughness coefficients does not account for local losses because of bends or flow expansion and contraction at bridges, debris dams, or riffles.

#### Recommendations

To refine the methodology used in this study, additional data should be collected from two more stream LWD removal projects. Streams with higher LWD density and different types of bed sediment from that encountered in this study would be preferable. Physical data should be collected over a range of flows varying from normal low-flow to bank-full conditions. Concurrent biological data should be collected at base flow. Data should be collected to document preproject and postproject conditions. Investigation of additional methods of determining LWD density, such as using video recorders or low altitude aerial photography to count and measure the LWD formations, is recommended.

APPENDIX B: BEST MANAGEMENT PRACTICES (BMPs) FOR  
SELECTIVE CLEARING AND SNAGGING\*

Trees and brush that shade streams and stabilize the banks should not be disturbed. In new channel construction, existing trees and brush should be left in place along the tops of banks. No stream work, including bank clearing and excavation or removal of materials, "snags," or other channel obstructions, should be allowed except at specific locations where significant blockages in streams occur. Channel excavation and snag removal should be accomplished with the minimum streambank clearing needed to provide access to the stream and should not be undertaken unless it is absolutely necessary. The following BMPs prescribe the manner in which snag removal and stream channel clearing should be undertaken:

a. Practices for snagging.

- (1) Logjam removal. Only those log accumulations that are obstructing flows to a degree that results in flooding or significant ponding or sediment deposition should be removed.
- (2) Removal of other logs.
  - Affixed logs. Isolated or single logs should not be disturbed if they are embedded, jammed, rooted, or waterlogged in the channel or the floodplain, if they are not subject to displacement by current, and if they are not presently blocking flows. Generally, embedded logs that are parallel to the channel are not considered to cause blockage problems and should not be removed. Affixed logs that are crossways to the flow of waters in the channel and are trapping debris to the extent that could result in significant flooding or sedimentation may be removed.
  - Free logs. All logs that are not rooted, embedded, jammed, or sufficiently waterlogged to resist movement by stream currents may be removed from the channel.
- (3) Protecting riparian vegetation. No rooted trees, whether alive or dead, should be cut unless:
  - They are leaning over the channel at an angle greater than 30 deg of vertical and they are dead or severely undercut, or damaged root systems are relying upon adjacent vegetation for support and it appears they will fall into the channel within 1 year and create blockage to flows; or
  - Their removal from the floodplain is required to secure access for equipment to a point where a significant blockage has been selected for removal.

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\* Source: State of New York (1986). The citation for this reference is included with those following the main text of this report.



Trees selected for removal should be cut well above the base, leaving the stump and roots undisturbed. Procedures for removing the felled portion should be the same as for other logs as discussed below.

- (4) Equipment for log removal. First consideration should be given to the use of hand-operated equipment to remove log accumulations. When the use of hand-operated equipment is infeasible, vehicular equipment should be used in accordance with the following guidelines:
    - Water-based equipment (e.g., a crane or winch mounted on a small, shallow draft barge or other vessel) should be used for removing material from the stream. A small crawler tractor with winch or similar equipment may be used to remove debris from the channel to selected disposal points.
    - When stream conditions are inadequate for the use of water-based equipment, the smallest feasible equipment with tracking systems that minimize ground disturbance should be specified for use. Larger equipment may be employed from nonwooded areas where cables could be stretched down to the channel to drag out materials to be removed.
    - Access routes for equipment should be selected to minimize disturbance to existing floodplain vegetation, particularly in the riparian zone. Equipment should be selected which will require little or no tree removal in forested areas.
  - (5) Log disposal practices. All logs or trees designated for removal from a stream or floodplain should be removed or secured in such a manner as to preclude their reentry into the channel by floodwaters. Generally, they should be transported well away from the channel and floodway and positioned parallel to the stream channel so as to reduce flood flow impediment. When large numbers of logs are removed at one location (e.g., logjams), their use for firewood may be most appropriate. Burying of removed material should not be permitted.
- b. Practices for stream channel clearing.
- (1) Small debris accumulation. Small debris accumulations should be left undisturbed unless they are collected around a log or blockage that should be removed. (Small debris accumulations will not constitute a significant blockage to flows. Upon removal of logs and other blockages under these BMPs and the following completion of the project, the changed water velocities will remove and disperse these small debris accumulations so that no significant blockage of water flows will result.)
  - (2) Removal of sediment and soils. Major sediment plugs in the channel may be removed if they are presently blocking the channel to a degree that results in ponding and dispersed overland flow through poorly defined or nonexistent channels and, in the opinion of appropriate experts, will not be removed by natural stream or river forces after logs and other obstructions have been removed.

(3) Disposal of spoil material. Conventional excavating equipment may be required for sediment blockages. This equipment should be employed in a manner which will minimize environmental damages as follows:

- Access routes for equipment should be selected to minimize disturbance to existing floodplain vegetation, particularly in the riparian zone.
- Material disposal and necessary tree removal should be limited to one side of the original channel at any given location.
- To the maximum extent possible, excavating equipment should not be employed in the stream channel bed.
- Where feasible, excavated materials should be removed from the floodplain. If floodplain disposal is the only feasible alternative, the spoil material should be placed on the highest practical elevation and no material should be placed in any tributary or distributary channels which provide for ingress and egress of waters to and from the floodplain.
- No continuous spoil pile should be created. It is suggested that no pile exceed 50 ft in length or width and a gap of equal or greater length should be left between adjacent spoil piles.
- Spoil piles should be constructed as high as sediment properties allow.
- The placement of spoil material around the bases of mature trees should be avoided where possible.
- All disturbed areas should be reseeded or replanted with plant species which will stabilize soils and benefit fish and wildlife. Revegetation should be in accordance with County Soil and Water Conservation District recommendations.
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