



## KENTUCKY TRANSPORTATION CENTER

### **FUTURE MANAGEMENT STRATEGIES FOR STATE MAINTAINED WETLANDS AND STREAM MITIGATION SITES**





## **OUR MISSION**

**We provide services to the transportation community**  
through research, technology transfer and education.

We create and participate in partnerships  
to promote safe and effective  
transportation systems.

## **OUR VALUES**

### **Teamwork**

Listening and communicating along with  
courtesy and respect for others.

### **Honesty and Ethical Behavior**

Delivering the highest quality  
products and services.

### **Continuous Improvement**

In all that we do.

**Research Report**

**KTC-08-17/SPR 349-07-1F**

**Future Management Strategies for State Maintained Wetlands  
And Stream Mitigation Sites**

By

**Sudhir Palle**

Associate Engineer Senior, Research

And

**Theodore Hopwood II**

Associate Engineer III, Research

Kentucky Transportation Center  
College of Engineering  
University of Kentucky  
Lexington, Kentucky

In cooperation with  
Kentucky Transportation Cabinet  
Commonwealth of Kentucky

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or the policies of the University of Kentucky, the Kentucky Transportation Center, nor the Federal Highway Administration. This report does not constitute a standard, specification, or regulation.

June 2008

<b>1. Report No.</b> KTC-08-17/SPR 349-07-1F	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>	
<b>4. Title and Subtitle</b> FUTURE MANAGEMENT STRATEGIES FOR STATE MAINTAINED WETLANDS AND STREAM MITIGATION SITES		<b>5. Report Date</b> June 2008	
		<b>6. Performing Organization Code</b>	
<b>7. Author(s)</b> , Sudhir Palle, and Theodore Hopwood II		<b>8. Performing Organization Report No</b> KTC-08-17/SPR 349-07-1F	
<b>9. Performing Organization Name and Address</b>  Kentucky Transportation Center College of Engineering University of Kentucky Lexington, KY 40506-0043		<b>10. Work Unit No. (TRAIS)</b>	
		<b>11. Contractor Grant No.</b>  KYSR 07-349	
<b>12. Sponsoring Agency Name and Address</b> Kentucky Transportation Cabinet State Office Building Frankfort, KY 40622		<b>13. Type of Report and Period Covered</b>  Final	
		<b>14. Sponsoring Agency Code</b>	
<b>15. Supplementary Notes</b>			
<b>16. Abstract</b>  This study was to identify existing wetland/stream mitigation sites owned by the Kentucky Transportation Cabinet (KYTC) and assess performance of those sites including problems encountered and maintenance costs. Initial work determined that KYTC Districts performed actions to address wetlands/stream mitigation maintenance under the direction and funding support of KYTC Division of Environmental Analysis. KYTC also sought to identify best practices employed by other transportation agencies. A survey of transportation agencies in neighboring states indicated that most significant "best practice" was to obtain wetland management oversight by their state Fish and Wildlife agencies 5 years after the permitting process (Section 404 of Clean Water Act).  Currently, management of KYTC-owned wetlands does not constitute a significant expense or maintenance burden on the KYTC Districts. They are able to perform most wetlands maintenance with effective guidance and support of the DEA. No recommendations are necessary for changes in practice or scope of DEA/district actions.			
<b>17. Key Words</b>  Wetlands, Maintenance, DEA		<b>18. Distribution Statement</b>  Unlimited with the approval of the Kentucky Transportation Cabinet	
<b>19. Security Classif. (of this report)</b>  Unclassified	<b>20. Security Classif. (of this page)</b>  Unclassified	<b>21. No. of Pages</b>  15	<b>22. Price</b>

## TABLE OF CONTENTS

ACKNOWLEDGEMENTS .....	iv
EXECUTIVE SUMMARY .....	v
1. INTRODUCTION .....	1
1.1 BACKGROUND.....	1
1.2 OBJECTIVES AND RESEARCH SCOPE.....	2
2. KYTC SURVEY .....	3
3. OBSERVATIONS AND CONCLUSIONS .....	3
4. RECOMMENDATIONS .....	4
5. APPENDIX: KYTC Districts Survey .....	5

## **ACKNOWLEDGEMENTS**

The authors would like to thank the members of the Study Advisory Committee; Chris T. Smith, Kevin Dant and John Dovak with Kentucky Transportation Cabinet for their efforts on this project.

## **EXECUTIVE SUMMARY**

The Kentucky Transportation Cabinet (KYTC) initiated KYSPR 07-349 “Future Management Strategies for State Maintained Wetlands and Stream Mitigation Sites” to identify existing wetland/stream mitigation sites in Kentucky and assess performance of those sites including problems encountered and related maintenance costs. The study was initiated with the assumption that there was no central oversight of wetland and stream mitigation sites, and that the KYTC Districts were responsible for tracking those and finding funding for maintenance of those sites. As the study progressed, it was established that while actions to address wetlands/stream mitigation sites were performed by the Districts, the Division of Environmental Analysis (DEA) has been providing consistent policy and actions throughout Kentucky. This included providing necessary funding for wetlands maintenance. KYTC also sought to identify best practices employed by other transportation agencies related to wetland management. KYTC conducted a telephone survey of neighboring states about this issue. Three neighboring state transportation agencies (Indiana DOT, West Virginia DOT, and Missouri DOT) participated in that survey. It identified that the practice of turning wetlands ownership/management over to state Fish and Wildlife agencies was the most important action indicated by neighboring transportation agencies. Another best practice was to properly mitigate wetland initially to limit follow-on maintenance and ensure proper performance of mitigated wetland. KYTC currently seeks to address both of those at all wetland mitigation sites.

Currently, management of KYTC-owned wetlands neither constitutes a significant maintenance burden to the Districts nor a funding burden to KYTC. The KYTC districts are able to perform most wetlands maintenance with effective guidance and support of the DEA. No recommendations are necessary for changes in practice or scope of DEA/District actions.

# 1. INTRODUCTION

## 1.1 BACKGROUND

KYTC construction projects often entail wetland and/or stream mitigation that result in the creation of compensatory wetlands or revised streambeds and riparian areas. Those mitigation sites frequently require on-going maintenance either to address Corps of Engineers (COE) mandates or impacts along adjacent roadways or private property (Section 404 of Clean Water Act). That maintenance is necessitated due to a variety of problems including improper design of mitigation, unanticipated flooding, mosquito infestation or beaver activity. In some cases, this maintenance has been extensive and required significant expenditures in terms of funds and KYTC personnel.

In the past, KYTC provided compensatory wetlands on an “as needed” basis. Consequently, many of those sites are scattered throughout Kentucky. The Division of Environmental Analysis (DEA) has some information about those and stream mitigation sites throughout the state. However, detailed maps/GPS data showing the exact locations/extents of those sites along with other pertinent information has not been collected centrally. The dispersion of the wetlands has resulted in a situation where some are landlocked. Many wetlands have not been attractive for assumption by outside entities due to accessibility and other factors including the nature of the wetlands and their size. Therefore, they have remained in KYTC ownership with the resultant responsibility for action when problems arose. In recent years, KYTC has sought to rely more on larger wetland banks with ownership reverting to others once the wetlands had met COE mitigation/ performance requirements. Stream mitigation sites are also distributed throughout the state and some have proven problematic. District forces have had to address related problems on a reactive basis and the extent of that maintenance has proven to be significant at some sites. Current KYTC policies address this situation and funding/personnel involvement through DEA that has the responsibility for maintenance which is implemented by the Districts.

While actions to address wetlands/stream mitigation sites must be performed by the Districts, a more visible central approach seems to be necessary to provide consistent policy and actions throughout Kentucky. For instance, if elimination of some local maintenance-intensive wetlands and their replacement with a single-better performing one proves viable, KYTC would probably need to negotiate that option with the Corps of Engineers. At the District level, best practices can be employed to provide the best resolution of problems on a maintenance action basis. More detailed information on the wetlands/stream sites can result in better decisions, more cost-effective actions and more uniform practice throughout Kentucky.



## **1.2 OBJECTIVES AND RESEARCH SCOPE**

The original objectives of the study as approved by SAC in August 2006 were.

1. Assess the performance of those sites including problems encountered and maintenance costs.
2. Determine “best practices” employed by other transportation agencies related to wetlands and stream mitigation sites.
3. Identify additional information needs to document/map existing wetlands and stream mitigation sites.
4. Track and monitor wetlands and stream mitigation sites that are already or in the process of being mitigated and maintained.
5. Take steps to incorporate all the requisite policies regarding wetlands into Field Operation Guide (FOG) of KYTC or into the database.
6. Investigate the creation of a computer-based environmental management system to track wetlands and stream mitigation sites and maintenance actions/costs.

The study objectives were amended in January 2008 to the current list provided above as a result of turnovers/retirements at the Kentucky Transportation Cabinet which resulted in SAC going through three successive chairpersons.

The study objectives approved by the Study Advisory Committee (SAC) in March 2008 were:

1. Identify existing wetland/stream mitigation sites in Kentucky.
2. Assess the performance of those sites including problems encountered and maintenance costs.
3. Determine “best practices” employed by transportation agencies in neighboring states related to wetlands and stream mitigation sites.

To address these goals the KTC researchers were assigned 4 tasks:

Task 1. Contact the Division of Environmental Analysis to obtain the list of existing compensatory wetlands and forthcoming wetlands mitigation sites. Also obtain any lists of stream mitigation sites. Survey all KYTC Districts offices to identify wetlands and stream mitigation sites being maintained by KYTC. This includes all pertinent information like deeds, animal life, plants, easements and etc., related to/or on wetlands/stream mitigation sites monitored by KYTC.

Task 2. As part of the District survey, request information on the performance of those sites identifying problem sites, maintenance actions performed/frequency and maintenance costs.

Task 3. Conduct a literature search and contact specific state transportation agencies to determine actions taken by others to address management/maintenance of wetlands and stream mitigation sites. Based upon this work, review the information and identify “best practices” for KYTC to consider adopting.

Task 4. Based upon the Task 1, identify additional information needs to document/map existing wetlands and stream mitigation sites and assess the practicality of obtaining/preparing this information.

## **2. KYTC SURVEY**

Based on the goals assigned to KTC researchers, a survey was prepared and approved by SAC members in April 2007 to be submitted to the KYTC district offices. The survey was conducted primarily through telephone contacts with district environmental coordinators and construction branch managers. Only six districts that had any information on wetlands being maintained by their maintenance crews responded to the survey which is attached to the report in the Appendix. This survey identified and was used to compile a list of wetland sites maintained by KYTC. The wetland sites are listed in the Appendix as part of the survey. The survey included information regarding the number of sites currently maintained by each district, the approximate size, type of wetland (natural or constructed) maintenance activities performed and budgeting options for those activities. The survey showed that KYTC districts rely on DEA personnel for management expertise. Also several district office personnel surveyed stated that DEA personnel would notify them of any maintenance work needed and would allocate the appropriate budget for the same.

Study Advisory Committee and DEA personnel were presented with the results of the survey in January 2008. At that meeting, SAC personnel asked KTC researchers to survey neighboring states to determine their maintenance activities and, more significantly, their long-term plans for wetlands they owned after permit process completion. The DOTs in the states of Illinois, Indiana, Ohio, Tennessee, West Virginia, and Missouri were surveyed by telephone as follow up on the above request.

## **3. OBSERVATIONS AND CONCLUSIONS**

KYTC district survey identified the wetlands maintained by KYTC districts. Based upon results of the KYTC survey, DEA has an efficient centralized oversight of wetlands and provides solutions for effective wetlands management. DEA personnel noted that they had an agreement with Fish and Wildlife Resources Department to manage and maintain some wetlands that satisfied the permit requirements of Army Corps of Engineers (Section 404 of Clean Water Act). The DEA is seeking to avoid future maintenance of wetlands by transferring ownership/management to Fish and Wildlife Resources department.

The telephone survey was conducted of neighboring state DOTs. The survey found that some states had agreements with their local Fish and Wildlife agencies to manage and/or transfer ownership of their wetlands in the long term. Indiana DOT had an agreement with their

Department of Fish and Wildlife to manage wetlands after 5 years which is typically the time COE requires for a wetland owner to maintain it after permitting/remediation. West Virginia DOT and Missouri DOT stated that they build many of their wetlands to be self sustaining for the long term when compared with KYTC.

#### **4. RECOMMENDATIONS**

Currently, management of KYTC-owned wetlands does not constitute a significant burden. The KYTC districts are able to perform most wetlands maintenance with effective guidance and support of the DEA. No recommendations are necessary for changes in practice or scope of DEA/district actions.

## **5. APPENDIX: KYTC Districts Survey**

	Dist. 1	Dist. 3	Dist. 4	Dist. 5	Dist. 8	Dist. 9
<b>Date of Survey</b>	10/2/2007	9/27/2007	9/27/2007	10/2/2007	10/29/2007	10/1/2007
<b>Contact</b>	Michael McGregor	Renee Slaughter	Bennie Warren	Jeff Schaefer	Cathi Blair	Karen Mynhier
<b>Phone #</b>	(270)-898-2431	(270)-746-7898	(270)-766-5066	(502)-367-6411	(606)-677-4017	(606)-845-2551
<b># of sites</b>	1 - Hickman County & 2 - Heath HS - McCracken County	1 - Logan Aluminum Property	Nelson County (KY 52 & KY 62	1 - Peaks Mill, KY & 2 - Greenbelt Hwy.	1 - Meadow Creek (Wayne County) Of the 240 acres that the cabinet purchased, 120 acres was prior converted cropland and 40 acres was hardwood forested wetland. The cabinet has currently conducted restoration work on 76 acres of the 120 pcc section. 2 - Lincoln County Wetland (Lincoln County) The cabinet purchased 150 acres - all of which was converted cropland. Restoration efforts are currently on-going on this site.	1 - South Shore, Greenup County, 2 - Arnett Site, Bath County, 3 - KY 801, Rowan County, 4 - AA Hwy, Industrial Pky, etc.

Approx. Size (Acres)	1 - 10 acres, 2 - 49 acres	1 - 2 acres	315 acres	Unknown			1 - 28.2 wetland acres/95.914 total acreage, 2 - 60 wetland acres, 3 - 1 acre, 4 - varies
Type	Both sites were constructed	Constructed	Constructed	Peaks Mill, KY - Emergent/Forested, Greenbelt Hwy. - Forested			1 - Single source/creation, 2 - Bank/creation & restoration, 3 - In-kind/on-site creation/restoration, 4 - In-kind/on-site creation/restoration
Does district perform any maintenance on those wetlands? (If no, skip to last question)	No	No	Yes	No	Yes	No	
If yes, is periodic or event based maintenance required? Ask contact to describe situations that require maintenance/why it is performed/how often it is required/is work done in-house or by contract?			Mowed once a year. Contract bid every year.		The only work that the District maintenance crews do is "event based". We will occasionally go out and mow sections of the site on an as-needed basis.		

<p>If yes, have you tracked wetlands maintenance costs? If not can you estimate those?</p>			<p>No</p>			<p>No, we have not tracked. The maintenance branch manager said that costs were very minimal.</p>	
<p>Is funding allocated for wetlands maintenance in the annual budget?</p>	<p>No</p>					<p>No</p>	
<p>If yes, is that funding sufficient to maintain all the wetlands in your District? If not, how is it compensated? Please discuss.</p>							
<p>Do you need additional training/guidance to address wetlands maintenance? If yes, please describe what training/guidance is needed?</p>	<p>No</p>		<p>No</p>			<p>If it ends up that our maintenance crews will be required to do any true "maintenance" at these sites, then I would say that they will need to be trained prior to that.</p>	

<p>Please provide any comments you have relative to this issue.</p>	<p>Both of the aforementioned projects were completed six to seven years ago. During construction of the McCracken County Site, it was determined after a year and all plantings had perished that it made more sense to plant fewer but larger trees. This proved to allow for the species to survive the designated proving period of three growing seasons.</p>	<p>District monitors this site once per year</p>	<p>No comments</p>	<p>This issue is overseen by Frankfort DEA. DEA sets up monitoring &amp; Maintenance of wetland sites statewide. The district is unaware of any maintenance requirements for these two wetlands.</p>	<p>Some maintenance issues are going to come up as these sites get older. Fencing will have to be repaired, signage may need to be updated, mowing may be needed, tree or vegetation replacement is needed, etc. We now have a funding mechanism as we develop the sites because we can charge to projects that are using the mitigation site. However, once all the credits are gone from the bank and the projects have been "closed out" and it still needs to be maintained, our funding mechanism will be gone. It would be very beneficial to have an account where the Districts can request maintenance</p>	<p>I am not aware of any maintenance that our Operations Branch has performed on any of these wetlands. KYTC did use a standing maintenance contract and contractor to construct the Bath County wetland, because that was determined to be the most efficient manner of construction for this small site. However, it really didn't involve routine maintenance activities.</p>
---	--	--	--------------------	--	---	--



								<p>funds for these sites (or stream mitigation sites as well). We may want to look at increasing the "in-lieu fees" for projects (say .5% of in-lieu fee) that will be maintained by DEA for use in maintenance of wetland or stream restoration sites. For example, on a site where we pay \$250,000 in-lieu fee to USFWS for wetland restoration, the Cabinet could put \$12,500 in a fund for wetland bank maintenance.</p>	
--	--	--	--	--	--	--	--	--	--

*For more information or a complete publication list, contact us at:*

**KENTUCKY TRANSPORTATION CENTER**

176 Raymond Building  
University of Kentucky  
Lexington, Kentucky 40506-0281

(859) 257-4513  
(859) 257-1815 (FAX)  
1-800-432-0719  
[www.ktc.uky.edu](http://www.ktc.uky.edu)  
[ktc@engr.uky.edu](mailto:ktc@engr.uky.edu)

*The University of Kentucky is an Equal Opportunity Organization*