

National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution

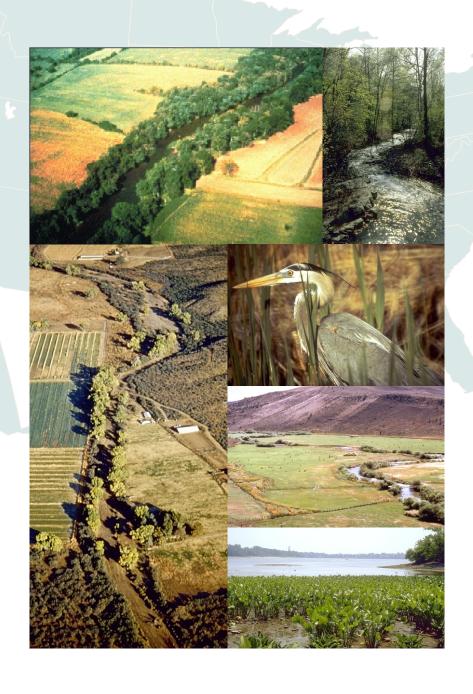
Cover, Disclaimer, and Table of Contents

Full document available at http://www.epa.gov/owow/nps/wetmeasures/

Assessment and Watershed Protection Division Office of Water U.S. Environmental Protection Agency



National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution





United States Environmental Protection Agency Office of Water Washington, DC 20460 (4503F)

> EPA-841-B-05-003 July 2005

National Management Measures to Protect and Restore Wetlands and Riparian Areas for the Abatement of Nonpoint Source Pollution

Nonpoint Source Control Branch
Office of Wetlands, Oceans and Watersheds
Office of Water
U.S. Environmental Protection Agency

July 2005

Disclaimer

This document provides guidance to States, Territories, authorized Tribes, and the public regarding management measures that may be used to reduce nonpoint source pollution through the protection and restoration of wetlands and riparian areas. At times, this document refers to statutory and regulatory provisions, which contain legally binding requirements. This document does not substitute for those provisions or regulations, nor is it a regulation itself. Thus, it does not impose legally-binding requirements on EPA, States, Territories, authorized Tribes, or the public and may not apply to a particular situation based upon the circumstances. EPA, State, Territory, and authorized Tribe decision makers retain the discretion to adopt approaches to control nonpoint source pollution by protecting and restoring wetlands and riparian activities on a case-by-case basis that differ from this guidance where appropriate. EPA may change this guidance in the future.

Contents

Chapter 1	Int	roduction	1
	1.1	What Are the Purpose and Scope of This Guidance?	2
	1.2	What Is in This Document?	3
	1.3	What Is Nonpoint Source Pollution?	5
	1.4	What National Efforts Are Under Way to Control Nonpoint Source Pollution?	<i>6</i>
Chapter 2	Ov	erview of Wetlands, Riparian Areas, and Vegetated Treatment Systems	11
	2.1	Wetlands and Riparian Areas	11
	2.2	Vegetated Treatment Systems	14
Chapter 3	Ma	nagement Measures	17
	3.1	How Management Measures Work to Prevent Nonpoint Source Pollution	17
	3.2	Management Practices	18
Chapter 4	Ma	nagement Measure for Protection of Wetlands and Riparian Areas	19
_	4.1	Management Practices for Protecting Wetlands and Riparian Areas	24
	4.2	Cost and Benefits of Practices	38
Chapter 5	Ma	nagement Measure for Restoration of Wetlands and Riparian Areas	43
	5.1	Management Practices for Restoration of Wetlands and Riparian Areas	51
	5.2	Cost and Benefits of Practices	56
	5.3	Mitigation Banking	58
Chapter 6	Ma	nagement Measure for Vegetated Treatment Systems	61
-	6.1	Management Practices for Vegetated Treatment Systems	66
	6.2	Costs and Benefits of Practices	78
Resources			81
Glossary			85
References			87
Appendices			
	A	Examples of Federal, State, Nonprofit, and Private Financial and Technical Assistance	
		Programs	A-1
	B	U.S. Environmental Protection Agency Contacts	B-1
	C	U.S. Army Corps of Engineers Wetland Contacts	
	D	U.S. Fish and Wildlife Service Regional Wetland Contacts	
	E	U.S. State and Territory Agency Wetland Contacts	
	\mathbf{F}	Index of Case Studies Organized by State, Territory, and Tribe	F-1

Tables		
Table 1-1	Example of Map Boxes Throughout Document Referencing Case Studies (Appendix F)	5
Table 4-1	Effectiveness of Natural Wetlands and Riparian Areas for NPS Pollutant Removal	20
Table 4-2	Federal Programs and Acts That Affect Wetlands in the United States	23
Table 4-3	Potential of Wetland and Riparian Areas for NPS Pollution Control	25
Table 4-4	Descriptions of Specific Wetland Types	26
Table 4-5	Assessment of Functions and Values for Protection of Wetlands or Riparian Areas	31
Table 4-6	Programmatic Approaches to Protecting Wetlands and Riparian Areas.	33
Table 4-7	Examples of State Guides for Wetland Protection and Management	34
Table 4-8	Costs and Economic Benefits Associated with Protecting Wetlands	39
Table 4-9	Planning and Outreach Costs and Benefits	40
Table 5-1	Examples of Projects to Restore Wetlands and Riparian Areas	53
Table 5-2	Examples of Wetland and Riparian Area Plant Information Resources	55
Table 5-3	Costs and Economic Benefits Associated with Restoring Wetlands and Riparian Areas	57
Table 6-1	Effectiveness of Vegetated Filter Strips for NPS Pollutant Removal	63
Table 6-2	Effectiveness of Constructed Wetlands for NPS Pollutant Removal	67
Table 6-3	Nitrate-N Concentration Reduced by Forested Riparian Areas and VFS	69
Table 6-4	Costs and Economic Benefits Associated with Vegetative Treatment Systems	78
Figures		
Figure 2-1	Relationship Between Wetlands, Uplands, Riparian Areas, and the Stream Channel	12
Figure 6-1	Example of Vegetated Filter Strip	62
Figure 6-2	Example of Constructed Wetland	64