WETLANDS & WATERSHEDS

A Local Ordinance to Protect Wetland Functions

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CENTER FOR WATERSHED PROTECTION

DECEMBER 2007

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Wetlands & Watersheds Article #4

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Prepared for:

Office of Wetlands, Oceans and Watersheds
U.S. Environmental Protection Agency
Washington, DC
www.epa.gov

December 2007

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Article 4 of the Wetlands and Watersheds Article Series

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Executive Summary

The Clean Water Act's Section 404 permit program addresses some direct impacts to wetlands, such as filling, but is not designed to regulate inputs of stormwater or other pollutants. Wetlands commonly receive the bulk of stormwater runoff from development sites because they are usually located at low points where runoff is directed. This can result in impacts such as sediment deposition and pollutant accumulation in wetlands, changes to wetland hydrology, and a shift in the makeup of wetland vegetative communities. These indirect impacts, although they originate outside the wetland itself, can drastically change wetland functions, such as flood control, habitat, and water quality protection.

Local development regulations can fill this gap in wetland protection since local governments typically have control over local land use regulations and decisions. Furthermore, local regulations can address not just where development takes place, but how it occurs. This article provides guidance on using local ordinances to protect wetland functions and provides a model Wetland Drainage Area Protection Ordinance. The model ordinance uses the following concepts and principles for protecting wetlands:

- *Identify sensitive wetlands:* A local government will likely want to prioritize which wetlands the ordinance applies to, particularly in communities with extensive wetland resources. Sensitive wetlands have a low tolerance for disturbance and will become degraded with even low-level inputs of urban stormwater. Wetlands that provide a vital community or ecological function (e.g., flood control, protected species habitat) may also be designated as sensitive.

- *Address wetland contributing drainage areas:* In order to address indirect impacts from land development and stormwater runoff, the ordinance applies to all the land that drains to a sensitive wetland through surface flow (and subsurface flow if adequate information is available to identify these areas). This regulated area is referred to as the contributing drainage area, or CDA.

- *Apply wetland protection criteria:* For projects where some or all of the parcel is located within a sensitive wetland CDA, the ordinance provides performance criteria, termed Wetland Protection Criteria. The performance criteria are intended to reduce indirect impacts to wetlands by locating the development away from the wetlands, providing vegetated buffers, and reducing runoff and pollutants into the wetland through the use of site design, erosion and sediment control and stormwater management techniques.

Almost any local government can benefit from utilizing the model Wetland Drainage Area Protection Ordinance provided in this article to protect wetland functions. The language in the model ordinance is intended to provide an example for how a community's local Wetland Drainage Area Protection Ordinance might be structured or worded, and is not meant to be adopted verbatim. Therefore, modification of the ordinance language will be necessary in order to address specific local situations and concerns.

The model ordinance works best where a local government has conducted up-front mapping of sensitive wetlands and their CDAs within the jurisdiction (although this is not a firm prerequisite for using the model ordinance). Since local governments across the nation range greatly in their size, available resources, and current status of wetland protection, the model Wetland Drainage Area Protection Ordinance will not be implemented in each community in the exact same way. Four alternatives are provided for communities with different local drivers and characteristics to implement the ordinance to protect local wetland functions.

About the Wetlands & Watersheds Article Series

The Wetlands & Watersheds article series was developed by the Center for Watershed Protection (CWP) in cooperation with the United States Environmental Protection Agency (USEPA). Funding for this project was provided by USEPA under cooperative agreements number CD-83192901-0 and WD-83264101-0.

Collectively, wetlands provide many watershed benefits, including pollutant removal, flood storage, wildlife habitat, groundwater recharge, and erosion control. While watersheds and wetlands are interconnected systems, their management is often segregated along regulatory and jurisdictional lines. Recent initiatives, such as the National Wetlands Mitigation Action Plan, provide a potential framework to integrate wetland protection in the context of larger local and state watershed planning efforts. However, no specific guidance exists for managing wetlands in the context of local watershed plans, and local governments often lack the tools and knowledge to effectively protect critical wetlands. This project was designed to fill this gap by expanding CWP's current watershed protection guidance, tools, and resources to integrate wetlands into larger watershed protection efforts. A key message conveyed in this new guidance is that wetlands should not be managed separately from other water resources because they are integral to water resource management.

This project included *research* on urban wetlands and local protection tools, *synthesis* of the research into a series of articles, and *transfer* of wetland protection tools and resources to wetland and watershed professionals across the country. The audience for the articles includes local natural resources managers and land planners who would benefit from guidance on local tools for protecting wetlands. The Wetlands & Watersheds article series includes the following:

Article 1: Direct and Indirect Impacts of Land Development on Wetland Quality
This article reviews the direct and indirect impacts of urbanization on wetlands, and describes the benefits wetlands provide at the watershed scale.

Article 2: Using Local Watershed Plans to Protect Wetlands
This article presents detailed methods for integrating wetland management into the local watershed planning process.

Article 3: Adapting Watershed Tools to Protect Wetlands
This article describes 37 techniques for protecting wetlands through local programs and ordinances.

Article 4: A Local Ordinance to Protect Wetland Functions
This article outlines the key elements of an effective ordinance to protect wetlands from the indirect impacts of land development, and provides adaptable model ordinance language.

Article 5: The Next Generation of Stormwater Wetlands
This article revisits the design of stormwater wetland systems based on lessons learned from the field, and presents new concepts and design objectives for stormwater wetlands.

Article 6: The Importance of Protecting Vulnerable Streams and Wetlands at the Local Level
This article makes the case for expanded local protection of vulnerable streams and wetlands that may not be fully protected by state or federal law due to their perceived isolation from perennial or navigable waters. This article summarizes state and local approaches to closing this gap.

Other wetland-related products of this project include wetland slideshows, an annotated bibliography of wetland research, a listing of key wetland web resources, and more products available on the newly expanded CWP wetlands website at www.cwp.org/wetlands/index.htm.

The CWP project team included:

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Thanks are extended to our project officer Rebecca Dils, U. S. Environmental Protection Agency, Office of Wetlands, Oceans, and Watersheds, for her guidance and support throughout this project. Thanks are also extended to the following individuals who provided peer review of the article:

- Noel Challis, Platte County (MO) Parks and Recreation
- Steve Foley, King County, WA
- Albert McCullough, Sustainable Science
- Jim McElfish, Environmental Law Institute
- Bill Sapp, Southern Environmental Law Center
- Dale Wegner, Coconino County, AZ

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Introduction

This article introduces a new type of model ordinance for local protection of wetlands. Why is wetland protection at the local level needed? Local governments may make the assumption that the existing fabric of federal and state wetland permits is adequate to fully protect wetlands within their jurisdictions. It is true that these permits address some **direct** (e.g., filling, dredging, draining) impacts to wetlands that meet certain regulatory criteria. However, **indirect impacts** are customarily not addressed through these permits.

Indirect impacts originate on lands that drain into wetlands. These impacts result from alterations to vegetative cover, topography, and hydrologic conditions, and can include sediment deposition and pollutant accumulation in wetlands, changes to wetland hydrology, and a shift in the makeup of wetland vegetative communities. These indirect impacts, although they originate outside the wetland itself, can drastically change wetland functions, such as flood control, habitat, and water quality protection. Furthermore, control of these indirect impacts lies squarely within the purview of local governments through land management.

For these reasons, local governments have a critical role in wetland protection. This article provides guidance on using local ordinances to protect wetland functions. A model Wetland Drainage Area Protection Ordinance is included as Attachment A. This model includes performance criteria for wetland protection that address site design, aquatic buffers, erosion and sediment control, and stormwater management.

Why Adopt a Wetland Drainage Area Protection Ordinance?

Protecting wetland resources is vital to maintaining the health of our watersheds because of the important functions that wetlands provide. Wetlands improve water quality by removing pollutants, minimize flood damage by slowing and storing floodwaters, and protect shorelines from erosion by absorbing storm surges. Wetlands can provide needed groundwater recharge and habitat for birds and wildlife, as well as recreational and educational open space for watershed residents. Wetlands also help local economies through the production of goods such as timber, peat, rice, and cranberries, and indirectly support commercial and recreational fisheries. Article 1 provides a more detailed review of the benefits and functions provided by wetlands.

As watersheds are developed, wetlands are often impacted by increased inputs of urban stormwater runoff and associated pollutants, which means that the functions described above are reduced or even eliminated (Figure 1). The resulting impacts to wetlands from upstream or adjacent development are listed in Box 1 and are described in more detail in Article 1. Protecting wetland functions is important for watershed health, and helps meet the national goal of no net loss of wetland function. In addition, the cost of replacing wetland functions, such as flood control, can be a significant burden that ultimately falls on local government shoulders.

Figure 1. Wetland communities are indirectly impacted by stormwater runoff (left) and inputs of nutrients and trash (right)

Box 1. Indirect Impacts of Land Development on Wetland Quality

- Increased ponding and water level fluctuation
- Constriction of downstream flow
- Decreased groundwater recharge
- Hydrologic drought in riparian wetlands
- Sediment deposition
- Pollutant accumulation in wetland sediments
- Nutrient enrichment
- Chloride inputs
- Increased abundance of invasive and tolerant plant species
- Decline in the diversity of wetland plant and animal communities

The Clean Water Act's Section 404 permit program addresses some direct impacts to wetlands, such as filling, but is not designed to regulate inputs of stormwater or other pollutants. Wetlands commonly receive the bulk of stormwater runoff from development sites because they are usually located at low points where runoff is directed (Figure 2). Local development regulations can be used to fill this gap, and local governments, such as cities, counties, towns, and boroughs, typically have control over local land use regulations and decisions. Furthermore, local regulations can address not just **where** development takes place (e.g., outside wetland boundaries), but **how** it occurs (e.g., designs that protect open space, provide adequate erosion control, and use innovative techniques to treat stormwater).

Figure 2. These South Carolina wetlands receive runoff and sediment from an adjacent construction site

While adoption of any new ordinance involves some additional responsibility on the part of the local government, there are some benefits to adopting a local wetland protection ordinance that may offset this burden:

- The model ordinance encourages site designs that locate development away from wetlands, thus avoiding any direct impacts and eliminating the need for Section 404 permits. In fact, when applying for a permit to impact wetlands under Section 404, applicants must demonstrate that they have taken steps to avoid and minimize impacts. Avoidance of direct impacts reduces regulatory burden, review time, and expense for developers as well as for the regulatory agency.

- Communities that are regulated under the National Pollutant Discharge Elimination System (NPDES) Phase I or II stormwater program are already required to adopt erosion and sediment control and stormwater management ordinances. While most communities do not explicitly consider wetland protection in their ordinances, they could easily do so. In addition, all construction sites that disturb one acre or more of land are subject to construction stormwater permits. Therefore, many communities, even those not regulated under the NPDES program, will ultimately supplement state permits with local stormwater ordinances.

- Construction costs may be reduced by implementing the design techniques included in the model ordinance. Developments that utilize less impervious cover, conserve natural areas, and reduce stormwater runoff can be cheaper to build, bring higher premiums, and sell faster than conventional developments (CWP, 1998).

Adopting a Wetland Drainage Area Protection Ordinance is just one approach that local governments can take to protect wetlands. Article 2 outlines a framework for integrating wetland protection into watershed management, and Article 3 presents tools that local governments can use to protect wetlands from both direct and indirect impacts.

Who Should Adopt a Wetland Drainage Area Protection Ordinance?

Most local jurisdictions can benefit from improved protection of their wetland resources. An estimated 4,000 to 6,000 local governments across the country have taken measures to protect at least some wetlands in their jurisdictions, often times in the form of adopting local wetland protection ordinances (Kusler, 2006). Some states provide model ordinances for wetland protection that local jurisdictions can adopt. However, these wetland protection regulations typically focus on regulation of activities within the wetlands themselves, rather than their drainage areas. Research has shown that protecting wetlands from direct impacts alone is not sufficient to maintain wetlands' natural functions for water quality, groundwater recharge, and flood control (see Article 1). Therefore, almost any local government would benefit from utilizing the model Wetland Drainage Area Protection Ordinance provided in this article to protect wetland functions.

An important initial step is for a local government to evaluate the current status of wetland protection in their community by reviewing existing local codes and regulations. Article 2 provides some tools for evaluating local wetland protection status. Communities who would benefit most from adopting an ordinance to protect wetland functions include:

1. *Communities experiencing significant growth.* These jurisdictions have the unique opportunity to identify critically important wetland systems in advance of development, and conserve wetland functions during the development process, as opposed to trying to restore lost wetland functions later, at greater cost and with dubious outcomes.

2. *Communities experiencing flooding problems.* Wetlands are an asset to flood protection, and healthy wetlands provide the greatest opportunity for flood control. Wetland loss can increase risk to public safety, and may necessitate the construction of flood control structures at an enormous cost to federal, state, and local agencies. A local ordinance can strengthen protection measures for riparian wetlands that attenuate floodwaters.

3. *Communities where wetlands are an important part of the local economy.* Wetlands are used for recreational activities, such as hunting, fishing, and birdwatching, and can also produce marketable goods, such as timber, peat, and cranberries. Wetlands are also an important part of the life cycle for 75% of the fish and shellfish that are commercially harvested in the U.S (EPA, 2006). Therefore, many communities depend on wetlands as part of their local economy.

4. *Communities that are regulated under the NPDES stormwater program.* These communities are already required to develop programs to control erosion and runoff from development sites. This includes adopting erosion and sediment control and stormwater management ordinances. Specific performance criteria can be incorporated into these local ordinances to protect wetlands from indirect impacts and meet NPDES requirements concurrently.

About the Model Ordinance

The model Wetland Drainage Area Protection Ordinance (Attachment A) reduces impacts to wetlands and protects wetland functions. The ordinance uses the following concepts and principles for protecting wetlands:

- *Identify sensitive wetlands:* A local government will likely want to prioritize which wetlands the ordinance applies to, particularly in communities with extensive wetland resources. Article 2 suggests a system for identifying "sensitive wetlands" based on wetland type and condition. Sensitive wetlands have a low tolerance for disturbance and will become degraded with even low-level inputs of urban stormwater. Wetlands that provide a vital community or ecological function (e.g., flood control, protected species habitat) should also be designated as sensitive. Sensitive wetlands must be identified early in the development review process. The model ordinance works best where a local government has conducted up-front mapping of sensitive wetlands within the jurisdiction (although this is not a firm prerequisite for using the model ordinance).

- *Address wetland contributing drainage areas:* In order to address indirect impacts from land development and stormwater runoff, the ordinance applies to all the land that drains to a sensitive wetland through surface flow (and subsurface flow if adequate information is available to identify these areas). This regulated area is referred to as the contributing drainage area, or CDA. See Article 3 for methods for delineating wetland CDA boundaries. Again, wetland CDAs must be identified at an early stage of development review.

- *Apply wetland protection criteria:* For projects where some or all of the parcel is located within a sensitive wetland CDA, the ordinance provides performance criteria, termed Wetland Protection Criteria. These criteria address site design, aquatic buffers, erosion and sediment control, and stormwater management.

The model ordinance is structured to align closely with a community's existing process and requirements for land development. Therefore it does not repeat all of the details that are likely already contained in existing zoning or subdivision ordinances, but instead refers to these regulations where appropriate. The model ordinance does not require a permit separate from the standard building permit (although it can be modified to do so). As a result, site plan approval under zoning or subdivision regulations must be tied to compliance with the Wetland Drainage Area Protection Ordinance. Figures 3 and 4 illustrate how the local Wetland Drainage Area Protection Ordinance would actually be applied on a development site.

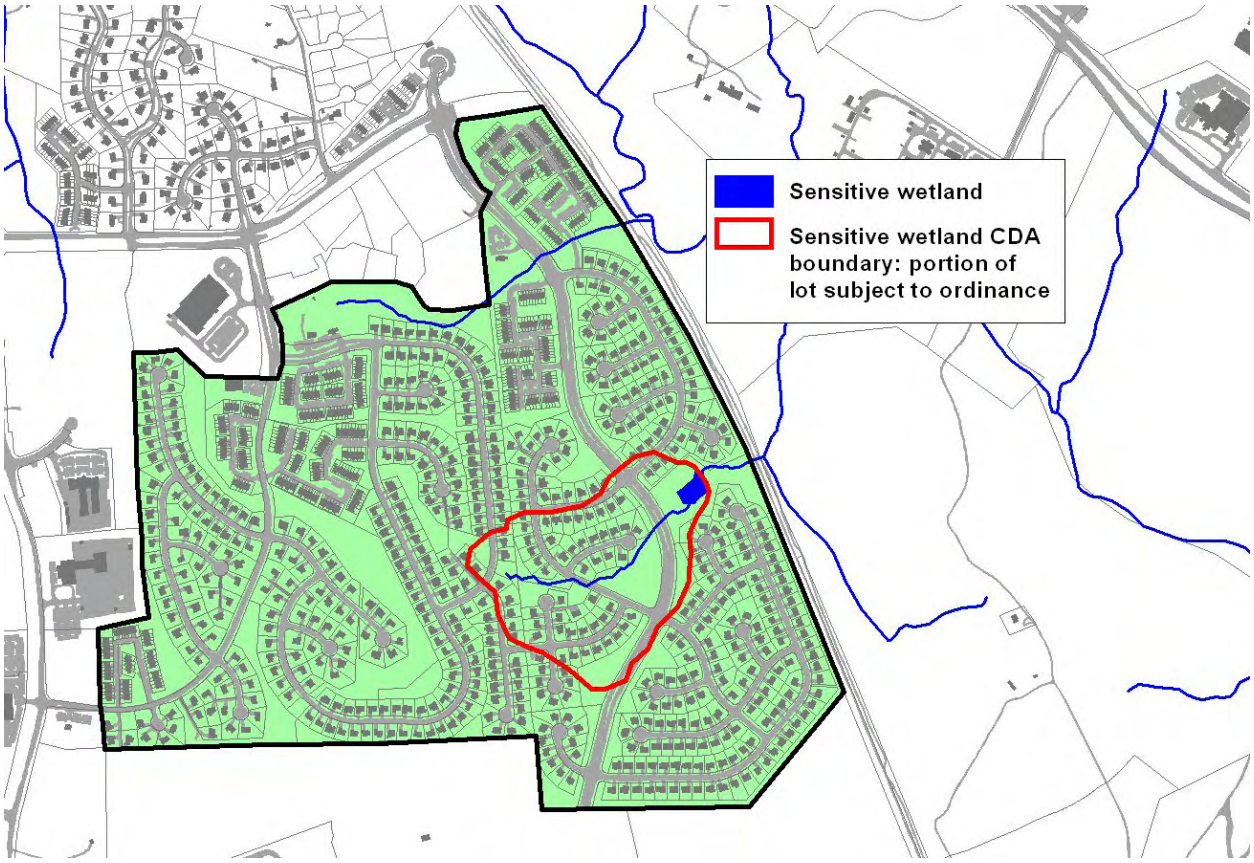

Figure 3. Wetland protection criteria are only applicable to portions of the site located in a sensitive wetland CDA

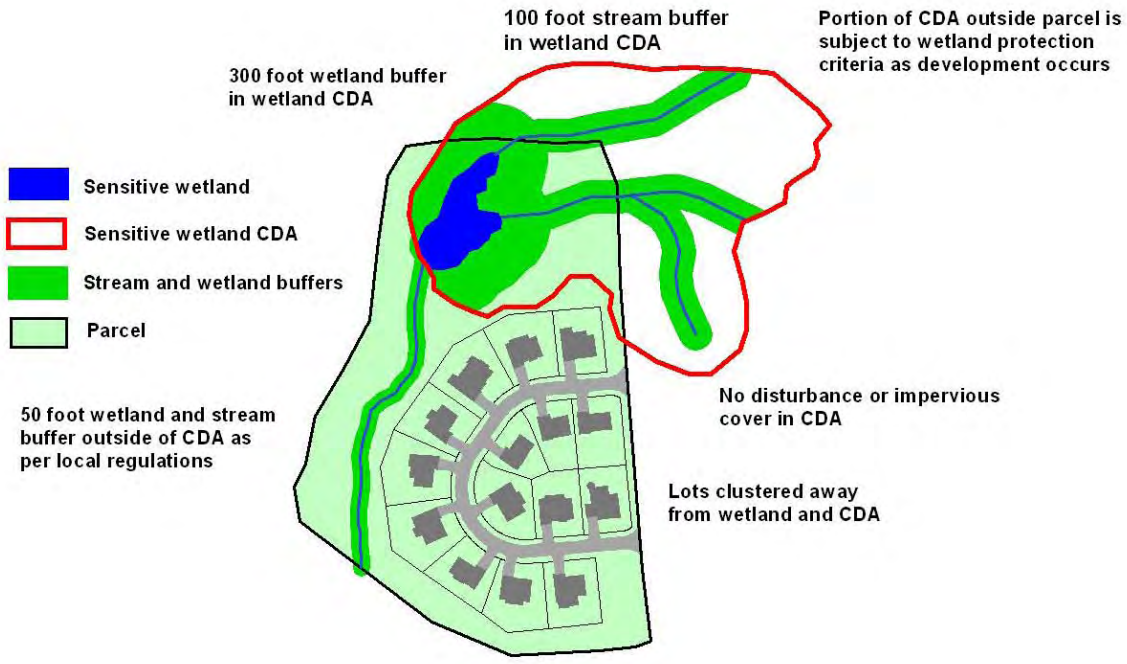

Figure 4. Application of wetland protection criteria directs development away from the wetland and reduces the need for wetland permits.

Organization

The model ordinance consists of eleven sections that provide suggested language and technical guidance to create an effective local Wetland Drainage Area Protection Ordinance. Each section is described briefly below.

1. **Findings of Fact** - This section describes the basis for the jurisdiction to regulate development to protect wetland resources by identifying the important public benefits of wetlands and potential impacts from development.

2. **Purpose** – This section describes the purpose of the ordinance.

3. **Definitions** – This section provides commonly understood and legally binding definitions used in the ordinance. These terms should be defined consistently across other related guidance and regulatory documents.

4. **Applicability** – The applicability section establishes what types of projects the ordinance applies to.

5. **Plan Submittal Requirements** – This section lists the required plan elements for submittal of land development proposals.

6. **Conditions of Approval** – This section sets the standards and conditions that the applicant must comply with in order to obtain permit approval.

7. **Fees** – This section outlines the fees the applicant must provide to the approval authority for submittal of plan submittal, amendments and variances.

8. **Other Permits and Approvals** – This section contains standard language that identifies the relationship of this ordinance to other local ordinances already in existence.

9. **Variances** – This section provides for the modification of certain or all criteria in this ordinance if unique conditions exist that would make strict application of the ordinance inadequate to protect wetlands, as determined by the approval authority.

10. **Wetland Protection Criteria** – This section lists performance criteria for site development that must be met as a condition of the ordinance. The criteria address site design, aquatic buffers, erosion and sediment control, and stormwater management.

11. **Enforcement, Violations and Penalties** – This section identifies penalties, enforceable by the approval authority, for violation of the provisions of this ordinance.

Throughout the ordinance, text boxes indicated with a 

symbol have been inserted to provide additional context to the ordinance sections. Where this symbol appears, the ordinance may need to be adapted to a specific community characteristic, or additional local information may be needed to develop ordinance language.

The model ordinance contains language in *italics* to refer to specific local entities, documents, and regulations. These should be replaced with the appropriate local counterpart. For example, where the ordinance refers to the *Local Stormwater Ordinance*, the ordinance writer should insert the name of the stormwater management regulation used by the community.

Factors to Consider When Using the Model Ordinance

The language in the model ordinance is intended to provide an example for how a community's local Wetland Drainage Area Protection Ordinance might be structured or worded, and is not meant to be adopted verbatim. Because of the huge variability in state and local government structures, it is not realistic to expect that one model ordinance would be applicable to the entire nation. Therefore, modification of the ordinance language will be necessary in order to address specific local situations and concerns.

The early identification of sensitive wetlands and their CDAs requires some level of advance mapping based on available resources. It is preferred that local governments complete the wetland inventory methods outlined in Article 2, including updating wetland maps, identifying sensitive wetlands, and delineating sensitive wetland CDAs prior to developing an ordinance. Communities that are unable to complete the inventory may use one of the implementation alternatives described in the following section. At a minimum, National Wetland Inventory (NWI) maps available from http://www.fws.gov/nwi/ and hydric soils from state or local soil surveys are required for any of these approaches to indicate the presence of wetlands or potential wetlands.

Use of this model ordinance may reduce direct impacts by encouraging designs that locate development away from wetlands and reduce inputs of stormwater runoff and associated pollutants into wetlands. However, this ordinance does not address the issuance of permits for direct impacts to wetlands. It assumes that any direct impacts to wetlands from proposed development projects will trigger a review by the appropriate federal, state and/or local entity. Most commonly, this falls under the purview of the Army Corps of Engineers under Clean Water Act Section 404. It is important to note that Section 404 does not protect "isolated" wetlands; therefore, local governments may wish to adopt their own wetland regulations to provide expanded protection from direct impacts (Article 6). Kusler and Opheim (1996) provide some model language for local wetland protection ordinances that regulate direct impacts.

Adopting a Local Wetland Drainage Area Protection Ordinance

The local Wetland Drainage Area Protection Ordinance proposed here is the first of its kind and therefore requires an equally unique approach to implementation. The discussion below provides some alternatives for communities who wish to adopt the model ordinance, as well as tips for garnering local support in the adoption and implementation process.

Implementation Alternatives for Communities

Local governments across the nation range greatly in their size, available resources, and current status of wetland protection. In light of this, the model Wetland Drainage Area Protection Ordinance will not be implemented in each community in the exact same way. Four options for

implementing the ordinance concepts are suggested below. Table 1 provides some guidance on which of these approaches is most appropriate for various community types.

1. *Adopt a local wetland protection ordinance to regulate both direct and indirect impacts to sensitive wetlands.* Some states provide model ordinances for local regulation of activities within wetlands (i.e., direct impacts). Under this approach, a local ordinance could be developed to regulate direct impacts to sensitive wetlands and this ordinance could incorporate the Wetland Protection Criteria provided in the model ordinance to also protect sensitive wetland functions form indirect impacts. This approach is very intensive and requires some research into options for regulating activities within wetlands. In addition, coordination would be needed with Section 404, administered by the Army Corps, and any applicable state or local permitting system..

2. *Expand an existing natural resource protection ordinance, such as an overlay zone, to include regulation of activities within wetland CDAs.* Use of local natural resource protection ordinances and overlay zoning (e.g., wetland or floodplain ordinances) typically involves adopting maps of the areas to be protected. Prohibited, conditional, and by-right uses within the mapped area are articulated within the regulations. Under this approach, adopted natural resources maps could be expanded to include sensitive wetland CDAs and the Wetland Protection Criteria incorporated into the written regulations.

3. *Adopt a local Wetland Drainage Area Protection Ordinance to regulate activities within sensitive wetland CDAs.* This approach addresses development within sensitive wetland CDAs and makes the assumption that direct impacts to the wetlands themselves are adequately covered through Section 404 and/or applicable state permit programs. The model ordinance can be adopted in its entirety using this option (with some modifications to language). Sensitive wetland CDAs can either be designated up-front by the local government (including adoption of a map) or delineated on a site-by-site basis, triggered by a subdivision or site plan submittal. The former approach requires more intensive mapping and field efforts on the part of local government, while the latter requires more intensive and costly field efforts on the part of the developer, but reduces the mapping burden on the local government. The model ordinance follows the former approach, but can be modified to utilize the site-by-site approach if desired.

4. *Modify existing site development regulations to reduce impacts to wetlands.* The Wetland Protection Criteria can be incorporated across-the-board into existing ordinances, such as zoning, subdivision, buffers, stormwater management, and erosion and sediment control. Local governments that do not currently have these types of ordinances may want to consider adopting them. Some good model ordinances are listed in Box 2. The enforcement burden on the local government may be greater with this approach because the Wetland Protection Criteria are applicable to all development sites that fall within the jurisdiction of the ordinance (as opposed to a more narrowly defined overlay zone). Advance identification of sensitive wetlands and their CDAs is not required, which eliminates the need for communities to do detailed mapping and field assessment of their wetlands.

Box 2. Model Ordinances for Environmental Protection During Land Development

- U.S. EPA's Model Ordinance: Open Space Development
  http://www.epa.gov/owow/nps/ordinance/mol3.htm#topofpage
- U.S. EPA's Model Ordinance: Aquatic Buffers
  http://www.epa.gov/owow/nps/ordinance/mol1.htm
- U.S. EPA's Model Ordinance: Erosion and Sediment Control
  http://www.epa.gov/owow/nps/ordinance/mol2.htm#ml2
- Center for Watershed Protection's Post-Construction Stormwater Model Ordinance
  http://www.cwp.org

Table 1. Recommended Wetland Ordinance Approaches for Various Communities

Community Characteristics	Recommended Ordinance Approaches
• Staff positions dedicated to natural resources • Existing natural resources ordinances & programs • GIS and mapping capabilities • Political and community support for wetlands protection	1, 2, 3
• At least one staff person with natural resources duties • Existing zoning and subdivision codes • Existing or pending ordinances for erosion control and stormwater • GIS available through locality or regional planning agency • Local interest in wetland protection	2, 3, 4
• No staff available for natural resources • Existing zoning and subdivision codes • Some local interest in wetland protection	4

Regardless of the approach used, communities should review their existing local ordinances to make sure there are no conflicts with the new regulations. For example, a local Wetland Drainage Area Protection Ordinance that mandates use of open space design in sensitive wetland CDAs may conflict with the existing densities, lot sizes, and setbacks outlined in the zoning or subdivision ordinance. Conflicting regulations may necessitate changes to existing local codes. CWP (1998) contains a more thorough "Codes & Ordinance Worksheet" that can be used to systematically review existing codes and identify inconsistencies with the Wetland Protection Criteria in the model ordinance.

Communities will need to provide some additional technical details on how to implement the Wetland Protection Criteria. Such detail is usually provided in the form of a separate design manual, which is incorporated by reference into the ordinance. The manual itself may not necessarily be a regulatory document and can be revised frequently to include the most up-to-date techniques without going through the lengthy ordinance revision process. Separate design manuals are usually provided for erosion and sediment control practices, stormwater treatment practices, and site design and construction specifications. The first two types are often

developed at the state level. Guidance and resources for updating stormwater design manuals are provided in CWP (2008).

Involving legal staff early in the ordinance drafting process is essential when developing any new local ordinance. This will ensure that potential conflicts with existing federal, state or local regulations are recognized early, and the necessary elements will be included in the ordinance to reduce landowner concerns about takings. In addition, the ordinance should be tailored to unique local ecological conditions, which may require some background research. CWP (2008) and McElfish (2004) are good resources for developing local ordinances.

Getting Support for the Ordinance

Some tips are provided below on getting local support for ordinance adoption:

1. *Seek federal and state assistance*. Local governments should look to their state and federal governments to help provide funding resources for the adoption of local ordinances that protect wetlands. State wetland regulatory agencies and coastal zone management agencies may be able to provide assistance with drafting local regulations or mapping wetlands. Federal grants that can be used to develop local ordinances that protect wetlands include:

    - EPA Assessment and Watershed Protection Program Grants: http://www.epa.gov/owow/funding/rfp.html

    - EPA Wetlands Program Development Grants: http://www.epa.gov/owow/wetlands/grantguidelines/

2. *Solicit public input.* A 1998 National Audubon Society poll showed that 82% of Americans say they support wetland protection over development. In light of this, ordinances that protect wetlands can be valuable public relations tools. At the same time, adoption of new regulations to protect environmental resources can be very controversial. To ease the process, it is always best to communicate with all affected parties reasonably early in the code development process. CWP (2008) provides a range of options for soliciting public input.

3. *Create a wetland protection task force or technical committee*. The local government may want to create a wetland task force or technical committee with representatives from the environmental community, government and developers to work together to iron out differences before the ordinance is introduced for adoption. Key members of this committee are local wetland scientists who can provide the background and data necessary to support adoption of the ordinance and can assist with tasks such as designating sensitive wetlands. This is especially important in small communities that do not have environmental staff.

4. *Identify local drivers or issues of local concern*. Property protection during floods, or perhaps protection of a treasured local hunting or birdwatching spot may be critical issues in the community. Wetland Drainage Area Protection Ordinances will have a greater chance of success if they are tied to issues of local concern. These ordinances should also seek to dovetail with existing regulatory programs and drivers so that multiple objectives are met.

For instance, the ordinance can help a community comply with Phase I or II NPDES requirements or state and regional watershed plans.

5. *Balance regulatory and non-regulatory approaches.* In many communities, a strictly regulatory approach can be a hard sell. However, when these approaches are combined with non-regulatory strategies, the entire package will be more palatable. Non-regulatory programs may include financial incentives (e.g., tax breaks or land use value taxation for protected wetlands), regulatory incentives (e.g., stormwater credits for expanded or restored wetland buffers), or community outreach (e.g., wetland signage, volunteer clean-up days, wetland bird surveys).

6. *Educate the public!* Many watershed residents are unaware of the benefits that wetlands provide. Many developers and contractors are unaware of the cost savings associated with site design techniques encouraged in the model ordinance. Education of the general public, local officials, and developers about wetland functions and the benefits of protecting wetlands are key in getting local support for the ordinance. Demonstration sites on government or private land are an especially good way to show how innovative site design and stormwater practices can protect wetlands and provide attractive and functional community amenities.

Summary

Protecting wetland functions is just as important as maintaining the acreage of wetlands within a watershed. The model ordinance proposed here is a template for providing local governments with the tools needed to protect wetland functions in their communities. This ordinance is just one component of a comprehensive local approach to wetland protection. Some other important elements of a good local wetland program include:

- Ensure local staff and programmatic capacity is adequate to enforce the ordinance and other regulations
- Make wetland protection a key component of the local watershed planning process
- Work with local land trusts to permanently protect wetlands using conservation easements and other land protection tools
- Quantify the extent and benefits provided by isolated wetlands in the community
- Use constructed stormwater wetland systems that mimic some of the features of natural wetlands at development sites

The other articles in this series provide guidance on several of these topics. Specifically, Article 2 describes the process for incorporating wetlands into watershed plans and Article 3 describes tools for wetland conservation. Article 5 presents new designs for stormwater wetlands that enhance pollutant removal. Article 6 discusses the local role in protecting isolated wetlands and other vulnerable aquatic resources.

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Attachment A: Model Local Wetland Drainage Area Protection Ordinance

Section 1: FINDINGS OF FACT

Jurisdiction finds that wetlands are indispensable and fragile resources that provide many public benefits including the following:

- Maintenance of surface and groundwater quality through nutrient cycling and sediment trapping
- Flood control through temporary water storage, slow release, and groundwater recharge
- Recharge areas for groundwater supply
- Open space and passive outdoor recreational opportunities
- Habitat for many forms of fish and wildlife, including migratory waterfowl and rare, threatened or endangered wildlife and plant species.

Furthermore:

- Stormwater discharges to wetlands can sharply degrade their function and quality by altering their hydrologic regime, reducing water quality and changing wetland habitat and wildlife communities.
- Some wetlands, referred to as sensitive wetlands, have a particularly low tolerance for stormwater impacts. These wetlands can be negatively affected by changes to their hydrology caused by altered drainage patterns, increased stormwater inputs, and increased pollutant inputs.

Section 2: PURPOSE

The purpose of this ordinance is to protect sensitive wetlands by regulating activities deemed likely to have a significant negative or cumulative effect upon wetland resources on lands draining to these wetlands.

The focus of this ordinance is to protect wetlands by protecting their hydrologic conditions, habitat and water quality from the impacts of land development. There are no provisions contained in this model ordinance for direct, physical impacts to wetlands such as draining, filling or clearing (i.e., activities that result in wetland loss). Where direct physical impacts are proposed to wetlands it is assumed that either State or Federal regulations will apply, or that the local government has other ordinance provisions.

Section 3: DEFINITIONS

APPLICANT: A person who files an application for a land development permit under this ordinance and who is either the owner of the land on which the proposed land development would be located, a contract vendee, a lessee of the land, the person who would actually control and direct the proposed activity, or the authorized agent of such a person.

APPROVAL AUTHORITY: The municipal department or agency, and its authorized agents, that is responsible for coordinating the review, approval and permit process as defined by this ordinance.

AQUATIC BUFFER: A vegetated area of a specified width surrounding a stream, wetland or other water feature that is intended to provide some degree of protection to the water resource from human activity and other encroachment associated with development.

AREA OF DISTURBANCE: Land that is subject to grading, sediment and erosion control devices, vegetative clearing or other physical disturbance for development purposes.

CONTRIBUTING DRAINAGE AREA (CDA): Specific landscape features that transmit water to wetlands. These can include the topographic watershed, storm drainage network, and groundwater recharge areas.

A wetland CDA boundary is defined in its simplest form using mapping by connecting topographic high points using the wetland outlet as the beginning and ending point. This boundary should be modified to include the area drained by storm sewers or drainage networks that discharge into the wetland or its tributaries, where applicable. Delineation of groundwater recharge areas is more difficult since this requires a detailed analysis of hydrogeologic conditions. This analysis is recommended when delineating the CDA boundary for wetlands that are fed predominantly by groundwater, since the wetland's recharge areas may be located outside the limits of the topographic watershed.

To delineate CDAs, mapping data for streams and waterbodies, topography, and storm drainage features is needed. If desired, groundwater recharge areas that feed into the wetland may also be included. Article 3 provides guidance on CDA delineation for different wetland types.

HYDRIC SOILS: Soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

HYDROPERIOD: The pattern of fluctuating water levels within a wetland caused by the complex interaction of flow, topography, soils, geology and groundwater conditions.

LAND DEVELOPMENT: A human-made change to, or construction on, the land surface that changes its runoff characteristics. This includes, but is not limited to: construction of buildings or other structures, grading, filling, excavating, paving, creation of any impervious surfaces, drilling operations, mining, and permanent storage of materials or equipment. Development does not include minor land disturbing activities, such as home gardens and individual home landscaping projects and maintenance.

SENSITIVE WETLAND: Wetlands that are designated by *Jurisdiction* for protection under this ordinance due to their vulnerability, low tolerance for disturbance and/or provision of vital

community or ecological functions. A map of all wetlands designated as sensitive and their contributing drainage areas is provided in the *Adopted Local Wetland Map*.

Designation of wetland sensitivity is based on the *type* and *condition* of the wetland community and will vary by jurisdiction. Certain wetland types, such as bogs and fens, show signs of degradation (e.g., reduced diversity and abundance of plant or animal species) with low-level inputs of urban stormwater (see Article 1 for a review of studies). Local jurisdictions should work with state and federal environmental agencies, universities, or local wetland plant scientists to identify those wetland types that are sensitive in their community. Wetlands that are in good condition may also be more sensitive to disturbance. Wetlands that provide a vital community or ecological function should also be designated as sensitive wetlands. Sensitive wetlands may be identified through desktop and field assessments as outlined in Article 2.

The ordinance writer may choose to either reference a map of the community's designated sensitive wetlands or list the specific types of sensitive wetlands (or criteria for sensitivity) found in the community in the ordinance's definition of sensitive wetland.

STORMWATER TREATMENT PRACTICES (STPs): Structural and nonstructural measures that capture, temporarily detain, store, and/or infiltrate stormwater runoff, allowing pollutants to be removed, and runoff to enter local receiving waters more gradually.

WETLAND DELINEATION: The act of establishing the boundary between wetlands and uplands (or non-wetlands), as prescribed by federal and/or state criteria.

WETLAND SCIENTIST: A person having special knowledge by reason of education and work experience in natural, physical and biological sciences that meets the criteria for certification by the Society for Wetland Scientists Professional Certification Program, or similar education and background acceptable to the *Approval Authority*.

WETLANDS: All areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of hydrophytic vegetation.

There is no single definition of wetland that is used by all scientists, regulators, and policy makers, and what wetlands are subject to what regulations is a matter of continuing controversy. The ordinance writer may wish to refer to an existing definition of wetlands provided in federal, state or local regulations.

Section 4: APPLICABILITY

This ordinance shall be applicable to all land development, including, but not limited to, site plan applications, subdivision applications, and erosion and sediment control applications, meeting the criteria of both subsections (A) and (B):

A. All or part of a sensitive wetland CDA lies within the property boundaries, as verified by the *Approval Authority* using the *Adopted Local Wetland Map*. The *Approval Authority* may, at its discretion, conduct any necessary investigations to confirm the presence of sensitive wetlands and/or their CDAs on the property.
B. At least one of the following apply:
    1. The proposed development will result in a land disturbance of 2,500 square feet or greater
    2. The proposed development will result in creation of 1,000 square feet or more of new impervious cover.

The Applicability section establishes the types of projects the ordinance applies to. Applicability triggers are an important consideration since this determines how many sites will be subject to plan review and site inspections for compliance with the ordinance. The ordinance writer can adjust the Applicability section to change what types of projects trigger the ordinance. This threshold should be based on the local capacity for review and enforcement and the amount and type of wetlands in the area. For some localities, this may include nearly all development sites, while others may have a trigger based on amount of land disturbance, site size, or development type. Examples of alternative applicability triggers include:

- 1 acre or more of land disturbance (aligns with federal NPDES requirements)
- 5,000 square feet or more of new impervious cover
- Subdivisions with 7 or more lots

Some ordinances will have a variable trigger for new development versus redevelopment, especially if redevelopment is a critical component to an overall land use policy that encourages infill.

Section 5: PLAN SUBMITTAL REQUIREMENTS

In addition to the plan requirements outlined in the *Zoning or Subdivision Ordinance*, the Applicant must provide the following:

A. Where a sensitive wetland has been determined to exist on-site, the boundaries of the wetland and copies of all wetland assessments, applications, permits and correspondence with State and Federal agencies responsible for regulating wetland and stream impacts (if applicable);
B. Where the CDA of a sensitive wetland has been determined to exist on-site, the boundaries of the CDA;
C. Location of proposed area of disturbance;
D. Existing and proposed contours at two (2) foot intervals in all proposed areas to be disturbed and to a distance of 50 feet beyond;
E. Details of any drainage systems proposed both for the conduct of work, and after completion thereof, including locations of any point discharges;
F. An erosion and sediment control plan;
G. A stormwater management plan;

H. Written authorization for the *Approval Authority* to enter upon the property for the purpose of evaluating the application;

An application shall not be deemed as complete until the *Approval Authority* has received all information required in this section of the ordinance. The process for plan submittal and review outlined in *Zoning or Subdivision Ordinance* shall be followed.

An alternative for communities that have not mapped their sensitive wetlands and CDAs is to use a site-by-site approach to determine if the property lies within a sensitive wetland CDA. The ordinance writer can modify Section 4 and Section 5 to reflect the following:

- During the standard preliminary submittal review or a pre-application conference, require the applicant to provide a map using the best available data (e.g., National Wetlands Inventory, Natural Resources Conservation Service soils information, and topography at contour intervals appropriate for the size and scale of the project). The Approval Authority should use the mapping to make a preliminary determination about whether the proposed project impacts sensitive wetlands or their CDAs. The purpose of the pre-application conference is to make the Applicant aware of the local regulations that may affect the development before he/she makes any significant investments in the project and to notify Applicants about the need for federal or state permits for direct impacts to streams and wetlands.

- Require the preliminary mapping described above to extend 2000' from the site boundary, particularly in areas downgradient of the property. The objective is to detect the majority of cases where the CDA of an off-site wetland is located on the property under review. This component adds complexity to the administration of the ordinance. The local government should make a determination about whether to include this feature and the appropriate distance of required off-site mapping based on factors such as the extent and reliability of existing wetland mapping data.

- If the property or the area within 2000' feet of the property boundary (particularly areas downgradient of the site) contain potential wetlands based on the preliminary mapping data, use the following process to determine if the ordinance applies:
    a. A Wetland Scientist shall confirm and delineate all on-site wetlands
    b. The Approval Authority shall confirm all off-site wetlands using best available information and a site visit where feasible and permitted by the property owner
    c. The Approval Authority shall determine if the wetlands in question are sensitive
    d. The Approval Authority shall delineate sensitive wetland CDA boundaries

  Where this process determines that all or a portion of the property falls within a sensitive wetland CDA, the ordinance applies.

Section 6: CONDITIONS OF APPROVAL

It shall be unlawful to conduct land development that violates the provisions of this ordinance or to issue a permit for land development until the requirements of this ordinance have been fully met. Any permit issued pursuant to this ordinance shall contain the following conditions:

A. Work conducted under a permit shall be open to inspection at any time by the *Approval Authority*, or their designated representatives.
B. The Applicant shall notify the *Approval Authority*, in writing, of the date on which the land development is to begin at least five (5) days in advance of such date.
C. The Applicant must maintain compliance with all Wetland Protection Criteria specified in Section 10 of this ordinance or be subject to penalties outlined in Section 11 of this ordinance.
D. For plans approved in accordance with this ordinance that contain stormwater treatment practices, restoration, and/or reforestation practices, the following shall be required prior to approval of the final plan:
    1. The Applicant shall furnish financial security in the form of a bond, an irrevocable letter of credit, or other security accepted by the *Approval Authority*. The amount and conditions of the security shall be consistent with the purpose of this ordinance and sufficient to cover the costs of construction of the practices, in accordance with the approved plan.
    2. The Applicant shall execute a maintenance agreement and maintenance plan. The agreement and plan shall be recorded in the office of the clerk of the circuit court for *Jurisdiction* and shall run with the land. The agreement shall designate the owner, governmental agency, or other legally established entity (responsible party) that shall be permanently responsible for maintenance of the practices required by the approved plan.
    3. At the discretion of the *Approval Authority*, easements may be required for the conveyance or treatment of stormwater, maintenance access to practices, and/or the long-term protection of wetlands and wetland buffers.

Section 7: FEES

Each Applicant seeking approval of a plan that is subject to the conditions of this ordinance, as specified in Section 4 of this ordinance, shall pay a fee upon submittal of such plan, in amounts according to the schedule set forth below.

A. Plan Submittal: $_____
B. Amendment to an Approved Plan: $_____
C. Request for a Variance: $_____

Section 8: OTHER PERMITS AND APPROVALS

No permit granted pursuant to this ordinance shall remove an Applicant's obligation to comply in all respects with the applicable provisions of any other Federal, State, or local law or regulations. Where the standards and management requirements of this ordinance are in conflict with other laws, regulations, and policies, the more restrictive shall apply.

Section 9: VARIANCES

The *Approval Authority* may alter, modify, or waive any of the requirements of this ordinance when it receives a written request for a variance from the proponent, and

A. It determines that a variance is necessary to accommodate an overriding community, state regional or national public interest. The Applicant shall have the burden of demonstrating that there is no reasonable alternative design of the project that would minimize negative impacts to sensitive wetlands and that the activity serves an overriding public interest, **OR**
B. In the case of an unimproved lot existing prior to the effective date of this ordinance, the Applicant proves by a preponderance of the credible evidence that a regulation contained herein will deprive the Applicant of any economic use of the Applicant's property as a whole, including any present or former property of the Applicant which previously incorporate the subject lot. The Applicant shall have the burden of proving that there is no reasonable alternative design of the project or use of the lot that would result in any economic use while still complying with these and other applicable regulations.

In granting a variance, the *Approval Authority* may impose reasonable conditions deemed necessary to protect sensitive wetlands and their CDAs. An Applicant requesting a variance may be required to verify that the variance request is not based on conditions or circumstances that are the result of actions by the Applicant.

Section 10: WETLAND PROTECTION CRITERIA

For all land development subject to this ordinance, as determined in Section 4, the Applicant shall apply the following Wetland Protection Criteria within all portions of the property that lie within a sensitive wetland CDA. These criteria must be met unless a variance is granted by the *Approval Authority* as outlined in Section 9.

Wetland Protection Criteria build upon existing local requirements for site design, aquatic buffers, erosion and sediment control, and stormwater management. If local requirements for these elements do not exist for your community, you may want to consider adopting some ordinances. The Wetland Protection Criteria are provided in this ordinance may be adapted for a particular community. In general, communities should aim to identify Wetland Protection Criteria that are more stringent than existing requirements, in order to protect downstream sensitive wetlands from excess stormwater runoff and pollution. Additional criteria and language for aquatic buffers, open space design, erosion and sediment control, and stormwater management are provided in the following model ordinances:

- U.S. EPA's Model Ordinance: Aquatic Buffers: http://www.epa.gov/owow/nps/ordinance/mol1.htm
- U.S. EPA's Model Ordinance: Open Space Development http://www.epa.gov/owow/nps/ordinance/mol3.htm#topofpage
- U.S. EPA's Model Ordinance: Erosion and Sediment Control http://www.epa.gov/owow/nps/ordinance/mol2.htm#ml2
- Center for Watershed Protection's Post-Construction Stormwater Model Ordinance http://www.stormwatercenter.net

Section 10.1 Site Design

Site design techniques that reduce impervious cover, conserve natural areas, and reduce stormwater runoff protect water resources, such as wetlands, by mitigating the stormwater impacts that would otherwise occur. The following performance criteria shall apply to development within sensitive wetland CDAs.

A. No land development shall take place within a wetland or its buffer, except as provided in subsection 10.2 or as authorized by the *Approval Authority* through the variance process in Section 9 AND that has received all relevant permits from state and federal agencies.
B. To the extent practicable, the land development shall take place outside of the wetland CDA. This is applicable for sites where part of the property is within the CDA, and part outside the CDA. Depending on the site characteristics, the design should strive to locate most of the land development on the part of the property outside of the CDA. If this is not possible, then impervious cover should be located outside of the CDA to the extent practicable.
C. If a development layout as prescribed in subsection (B) of this section is not feasible or practical, then any development within the CDA shall adhere to the following standards:
    1. The number of stream and wetland crossings shall be the minimum necessary by applying the following techniques:
        a) Using efficient road layouts that limit the number of crossings

b) Using lot layouts, such as open space design, that focus development away from wetlands and their buffers
c) Utilizing existing crossings and upgrading as necessary
d) Locating all utilities and roads at a single crossing
e) Avoiding crossings and other constrictions at the outlet points for wetlands.

2. The amount of impervious surface within sensitive wetland CDAs shall be the minimum necessary by applying the following:
   a) Designing residential streets and street right-of-way widths for the minimum required pavement width needed to support the design. This should include minimizing the number of cul-de-sacs and the size of their radii.
   b) Reducing the total length of residential streets by examining alternative street layouts.
   c) Where density, topography, soils and slope permit, using vegetated open channels in the street right-of-way to convey and treat stormwater runoff.
   d) Minimizing paved areas in parking lots by using the minimum parking ratios and stall dimensions, efficient parking lanes, compact car stalls, pervious materials, shared parking and/or structured parking.
   e) Using the minimum side and front setbacks to minimize driveway lengths and reduce overall lot imperviousness. Shared driveways should be used where allowed and feasible.
   f) Where practical, locating sidewalks on only one side of the street, providing common walkways, using the minimum width of sidewalks based on pedestrian volume, and allowing runoff from sidewalks to flow to vegetated areas or a vegetated strip.
   g) Where feasible, utilizing alternative, pervious surfaces for driveways and parking areas to promote storage and infiltration of stormwater.
3. Cleared or disturbed areas, and off-lot areas currently in turf that are not within a utility easement or road right-of-way, shall be re-vegetated through planting plans and reforestation using native plant material wherever possible.
4. A natural drainage system shall be utilized wherever possible in sensitive wetland CDAs. This may include:
   a) Avoiding development-related construction activity in the most sensitive areas
   b) Fitting development to the terrain
   c) Utilizing natural topography and vegetated waterways to convey acceptable levels of runoff
   d) Directing runoff to pervious areas for infiltration
   e) Using soil amendments and planting plans to enhance and rejuvenate soil structure

<u>Section 10.2 Aquatic Buffers</u>

Aquatic buffers serve as natural boundaries between local waterways and development, and protect water resources by filtering pollutants, storing floodwaters, alleviating erosion, regulating water temperature, and providing wildlife habitat. The following performance criteria shall apply to sensitive wetlands and development within sensitive wetland CDAs:

A. The required buffer width for sensitive wetlands shall be a minimum of 100 feet.

B. The required buffer width for all streams and wetlands within sensitive wetland CDAs shall be a minimum of 100 feet.
C. For wetlands, the buffer shall be measured horizontally from the edge of the wetland boundary, as delineated by a Wetland Scientist in accordance with the appropriate Federal, state or local regulations.
D. Stream buffers shall be measured from the edge of the stream bank of the active channel.
E. Land development and removal of vegetation shall be prohibited within aquatic buffers, except as provided below:
    1. Roadway, driveway, and utility crossings shall be the minimum necessary to allow for the development, and shall cross streams in a perpendicular direction to the extent possible, and shall incorporate design features to allow for the natural flow of streams and natural wetland hydrology (e.g., spans, arch spans, bottomless culverts, etc.).
    2. Recreational pathways, greenways, and other passive recreational access shall incorporate design features to reduce impervious cover and direct runoff to vegetated areas or small, distributed treatment practices.
    3. Temporary erosion and sediment control practices shall be located outside of the buffer, except where the practice is absolutely necessary to protect streams and wetlands during construction (such as at a road crossing). All encroachments shall be returned to their natural condition after construction through a planting plan. Permanent stormwater treatment practices shall be located outside of the buffer.
    4. Stream and wetland restoration projects shall be allowed, provided that they use natural materials and are designed to restore natural stream and wetland functions.
F. Where the buffer area does not contain native vegetation, the buffer shall be reforested or otherwise restored to provide the appropriate vegetated width.
G. All buffers shall be permanently protected by easement and signs posted to notify landowners and contractors of their protected status.

Stream and wetland buffer widths of 50 to 100 feet are typically recommended to protect water quality, and wetland buffer widths of 100 to 350 feet or more are recommended for wetlands with important wildlife functions (Wenger and Fowler, 2000; Schueler, 2000; EOR, 2001; Chase et al, 1997; Castelle et al, 1992). Buffer widths should be selected based on the type, sensitivity, and characteristics of the resource being protected and political realities in the community. The buffer widths identified as part of the Wetland Protection Criteria should generally be more stringent than what is required elsewhere in the community in order to protect sensitive wetlands from indirect impacts.

Section 10.3 Erosion and Sediment Control

Erosion and sediment control (ESC) regulations are designed to safeguard persons, protect property, and prevent damage to the environment by preventing soil erosion and keeping soil from entering nearby waterways, including wetlands. In accordance with subsection 10.1, land development shall be located outside of a sensitive wetland CDA to the extent practicable. For

any land development that does take place within a sensitive wetland CDA, the following performance criteria shall apply:

A. Clearing and grading shall be limited to the amount necessary to construct buildings and roadways, allow construction access, and provide fire protection.
B. Clearing and grading is prohibited within aquatic buffers. All wetlands and aquatic buffers must be clearly marked in the field with durable and visible signage and fencing. Orange "snow" fencing shall be used along the perimeter of wetland buffers, unless an alternative type of fencing is permitted by the *Approval Authority*. Signs stating that no construction equipment is permitted shall be posted along the wetland buffer at adequate intervals.
C. Perimeter sediment controls must be installed along the length of all buffer boundaries. All perimeter controls shall be sized at 1.2 times their standard size as specified in the *Appropriate ESC Design Manual.* At its discretion, the *Approval Authority* may require the use of super silt fence where disturbed areas drain to sensitive wetlands or their buffers and where site conditions, disturbed areas, and/or slope lengths would otherwise warrant the use of silt fence.
D. The erosion and sediment control plan for construction sites that disturb greater than 25 acres shall incorporate a phasing plan that limits the disturbed area of each phase to 10 acres, unless other means are approved by the *Approval Authority*. Each phase shall be stabilized prior to land disturbance taking place in subsequent phases.
E. To the extent practical, disturbed drainage areas shall be limited to 3 acres. Disturbed drainage areas shall be limited through the use of clean-water diversions, diversion dikes, erosion control practices in series, and other means acceptable to the applicant and *Approval Authority*.
F. Temporary and/or permanent stabilization shall be applied within 10 days of reaching a grade that will not be changed for at least 30 days. Additional restrictions may be required at the discretion of the *Approval Authority* for areas in close proximity to wetlands or wetland buffers. These may include hand seeding and mulching with native seed mixes, use of erosion control matting or fabrics, or other measures deemed necessary for the prevention of invasive seeds or species being introduced into wetlands or their buffers.
G. The *ESC Inspector* shall conduct additional site inspections during and/or immediately after storm events to observe practice effectiveness and recommend adjustments if necessary.
H. Major grading operations shall be minimized during the rainy season.

The "rainy season" will vary in each region and should be defined based on local rainfall data. Communities should define an inspection schedule based on storm size and available resources for inspection.

Section 10.4 Stormwater Management

Post-construction stormwater management regulations are designed to control and minimize stormwater runoff and nonpoint source pollution to protect downstream water resources and

prevent threats to public health and safety. In accordance with subsection 10.1, land development shall be located outside of a sensitive wetland CDA to the extent practicable. For any land development that does take place within a sensitive wetland CDA, the following performance criteria shall apply:

A. All discharges of untreated stormwater runoff to the wetland are prohibited. All runoff from pollution-generating sources (e.g., roads, parking lots) on the development site must be fully treated before it reaches a wetland or wetland buffer.
B. Stormwater treatment practices are prohibited within wetland buffers and stream buffers.
C. Management of stormwater runoff shall strive to maintain pre-development hydrology by maximizing the use of practices that promote infiltration and filtering across the site, do not increase discharge temperatures, are capable of removing dissolved nutrients, and incorporate vegetation and landscaping. Stormwater credits may be given for use of site design techniques that reduce impervious cover.
D. The following performance criteria shall apply:
    1. Groundwater Recharge. The post-development groundwater recharge shall match the average annual pre-development levels based on the prevailing hydrologic soil groups present on the site.
    2. Water Quality. Capture and treatment of the water quality volume is required. The water quality volume (WQv) shall be defined as the rainfall depth of the 90th percentile annual rainfall event multiplied by the site's runoff coefficient, as follows:

        WQV (cubic feet) = 90th percentile depth (inches)/12 x Rv, where
        Rv = 0.05 + 0.009(I), where I is the percent impervious cover expressed as a whole number

There are many different local standards for calculating water quality treatment requirements. The 90% rule described above is the most common approach.

One alternative to the water quality volume approach is the site-based nutrient (phosphorus and/or nitrogen) load standard, which requires the site to meet per-acre nutrient load limits as established by the Approval Authority. These limits should be based on studies of the maximum loading that a sensitive wetland can sustain without suffering adverse impacts. This approach requires the Approval Authority to set a per-acre limit for nutrients (e.g., 0.28 pounds per acre per year of total phosphorus), which requires a higher level of sophistication to administer, but provides a degree of water quality treatment that is more responsive to actual wetland conditions. Guidance on calculating nutrient load reductions is provided in CWP (2003) and MSSC (2005).

    3. Channel Protection. For any part of the site that discharges to a tributary that flows to a sensitive wetland, the discharge shall meet the following channel protection criteria:
        a. Wherever practical, maintain sheetflow to riparian buffers or vegetated filter strips. Vegetation in buffers or filter strips shall be preserved or

restored where existing conditions do not include dense vegetation (or adequately sized rock in arid climates).

b. Energy dissipaters and level spreaders shall be used to spread flow at outfalls
c. On-site conveyances shall be designed to reduce velocity through a combination of sizing, vegetation, check dams, and filtering media (e.g., sand) in the channel bottom and sides
d. If flows cannot be converted to sheetflow, they shall be discharged at an elevation that will not cause erosion or require discharge across any constructed slope or natural steep slopes.
e. Outfall velocities shall be non-erosive from the point of discharge to the limits of the sensitive wetland.
f. Based on the size of the on-site drainage area to a discharge point or the rate or velocity of discharge at a discharge point, the *Approval Authority* may require a downstream analysis, on-site peak rate control, and/or channel restoration in order to verify compliance with the Channel Protection requirements.

4. Hydroperiod. The site shall not significantly alter the pattern of water depth fluctuation and duration and frequency of inundation (known collectively as hydroperiod) for sensitive wetlands. The hydroperiod standard applies if EITHER of the following criteria are met:
    a. The sensitive wetland has no natural outlet AND the proposed site creates 10,000 square feet or more of new impervious cover within the CDA, OR
    b. The impervious area of the entire CDA (on-site and off-site) is 10% or greater AND the proposed site creates 10,000 square feet or more of new impervious cover within the CDA.

    If the hydroperiod standard applies to the site or a portion of the site, then the following performance standards shall be met for that portion:
    a. The total annual runoff shall be no greater after development than the pre-development condition. This shall be documented using available hydrologic data, local or regional models, and accepted engineering methods. The difference between post-development and pre-development runoff volume shall be managed using one or a combination of the following techniques:
        i. Distributed infiltration practices (e.g., bioretention, impervious disconnection, use of open space to capture and infiltrate runoff)
        ii. Capture and reuse of runoff (e.g., rain barrels, cisterns)
        iii. For site areas with low infiltration capacity due to soil, bedrock, water table, or other natural conditions, “extended” filtration of runoff. Extended filtration refers to filtering systems (e.g., bioretention) that have enough filter media (at least 36”) to allow for event-based volume reduction, even though underdrains may be provided.

iv. No diversion of runoff around the wetland unless authorized by a variance in accordance with Section 9.

b. Stormwater conveyance systems shall be configured to avoid the concentration of runoff to a single outlet point. Where possible, multiple outlets treating smaller drainage areas shall be used.
c. All outlets to sensitive wetlands shall be located outside of the wetland buffer and be designed with energy dissipaters and spreader devices to effectively spread the flow across the buffer.
d. The site design shall incorporate an interconnected network of natural vegetation that is connected to the wetland buffer so that natural drainage patterns can effectively disperse runoff from the site.

Examples of guidance on allowable changes to water level fluctuations are provided in Washington State DOE (2005) and MSSC (2005).
The sizing criteria presented above may be adapted for a locality, but should generally be more stringent than what is currently required elsewhere in the locality. Modification of the community's existing design guidance and/or stormwater management ordinance may be in order.

Section 11: ENFORCEMENT, VIOLATIONS AND PENALTIES

Section 11.1 Violations

Any action or inaction which violates the provisions of this ordinance, the requirements of an approved plan or permit and/or the requirements of an approved maintenance agreement may be subject to the enforcement actions outlined in this section. The *Approval Authority* shall enforce this ordinance and may abate any such action or inaction by injunctive or other equitable relief. The imposition of any of the penalties described below shall not prevent such equitable relief.

Communities should consider whether a violation of the Wetland Drainage Area Protection Ordinance should also constitute a violation of the Zoning or Subdivision Ordinance, and may wish to make amendments to those regulations accordingly. For example, the Zoning Ordinance could specify that compliance with the Wetland Drainage Area Protection Ordinance is required for issuance of any approvals issued under the Zoning Ordinance, so that any land development not complying with the these regulations is also prohibited under zoning.

Communities may also choose to simply refer to the local Zoning or Subdivision Ordinance for administration, enforcement, violations and penalties.

Section 11.2 Notice of Violation

If the *Approval Authority* determines that the Applicant has failed to comply with the provisions of this ordinance, it shall issue a written notice of violation to such Applicant. Where a person is

engaged in an activity covered by this ordinance without having first secured a permit, the notice of violation shall be served on the owner or the responsible person in charge of the activity being conducted on the site. The notice of violation shall contain:

A. The name and address of the owner or the applicant or the responsible person;
B. The address or other description of the site upon which the violation is occurring;
C. A statement specifying the nature of the violation;
D. A description of the remedial measures necessary to bring the action or inaction into compliance with this ordinance and the date for the completion of such remedial action;
E. A statement of the penalty or penalties that may be assessed against the person to whom the notice of violation is directed; and,
F. A statement that the determination of violation may be appealed to the *Governing Board Of Jurisdiction* by filing a written notice of appeal within thirty (30) days after the notice of violation (except, that in the event the violation constitutes an immediate danger to public health or public safety, 24 hours notice shall be sufficient).

Section 11.3 Penalties

In the event the remedial measures described in the notice of violation have not been completed by the date set forth for such completion in the notice of violation, any one or more of the following actions or penalties may be taken or assessed against the person to whom the notice of violation was directed.

A. The *Approval Authority* may suspend, revoke, or modify the permit authorizing the land development project. A suspended, revoked, or modified permit may be reinstated after the applicant or other responsible person has taken the remedial measures set forth in the notice of violation or has otherwise cured the violations described therein, provided such permit may be reinstated upon such conditions as the *Approval Authority* may deem necessary to enable the Applicant or other responsible person to take the necessary remedial measures to cure such violations.
B. In the event the Applicant fails to take the remedial measures set forth in the notice of violation, the *Approval Authority* may bring a civil action against the Applicant. The action may seek to impose a penalty not to exceed $1,000 (depending on the severity of the violation) for each day the violation remains un-remedied after receipt of the notice of violation.
C. For intentional and flagrant violations of this ordinance, the *Approval Authority* may issue a citation to the Applicant, requiring such person to appear in *Appropriate Municipal, Magistrate, or Recorders Court* to answer charges for such violation. Upon conviction, such person shall be punished by a fine not to exceed $1,000 or imprisonment for 60 days or both. Each act of violation and each day upon which any violation shall occur shall constitute a separate offense.

Specific penalties will vary between communities, and should reflect realistically enforceable penalties and time frames given the political realities of the jurisdiction. It is a good practice for a jurisdiction to agree on a set of normal civil penalties to be assessed for any commonly experienced violations. This assists the Approval Authority in making reasonable and equitable penalty assessments. The schedule of penalties should be included in Section 11.3.B.

Section 11.4 Appeals

The decisions or orders of the *Approval Authority* shall be final. Further relief shall be to a court of competent jurisdiction.