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Aquatic Buffers Model Ordinance

Section I. Background

Buffers adjacent to stream systems and coastal areas provide numerous environmental protection and resource management benefits that can include the following:

1. Restoring and maintaining the chemical, physical, and biological integrity of the water resources
2. Removing pollutants delivered from urban stormwater
3. Reducing erosion and sediment entering the stream
4. Stabilizing stream banks
5. Providing infiltration of stormwater runoff
6. Maintaining base flow of streams
7. Contributing the organic matter that is a source of food and energy for the aquatic ecosystem
8. Providing tree canopy to shade streams and promote desirable aquatic organisms

 *This benefit applies primarily to forested buffer systems. In some communities, such as prairie settings, the native vegetation may not be forest. See the example ordinance from [Napa, California](#), for an example.*

9. Providing riparian wildlife habitat
10. Furnishing scenic value and recreational opportunity

It is the desire of the (Natural Resources or Planning Agency) to protect and maintain the native vegetation in riparian and wetland areas by implementing specifications for the establishment, protection, and maintenance of vegetation along all stream systems and/or coastal zones within our jurisdictional authority.

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Section II. Intent

The purpose of this ordinance is to establish minimal acceptable requirements for the design of buffers to protect the streams, wetlands, and floodplains of _____ (jurisdiction); to protect the water quality of watercourses, reservoirs, lakes, and other significant water resources within _____ (jurisdiction); to protect _____'s (Jurisdiction's) riparian and aquatic ecosystems; and to provide for the environmentally sound use of _____'s (jurisdiction's) land resources.

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Section III. Definitions

Active Channel

The area of the stream channel that is subject to frequent flows (approximately once per one and a half years) and that includes the portion of the channel below the floodplain.

Best Management

Conservation practices or management measures that control soil loss and Practices (BMPs) reduce water quality degradation caused by nutrients, animal wastes, toxics, sediment, and runoff.

Buffer

A vegetated area, including trees, shrubs, and herbaceous vegetation, that exists or is established to protect a stream system, lake, reservoir, or coastal estuarine area. Alteration of this natural area is strictly limited.

Development

1. The improvement of property for any purpose involving building
2. Subdivision or the division of a tract or parcel of land into two or more parcels
3. The combination of any two or more lots, tracts, or parcels of property for any purpose
4. The preparation of land for any of the above purposes

Nontidal Wetlands

Those areas not influenced by tidal fluctuations that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.



The definition of "nontidal wetland" here is adapted from the definition of "wetland" used by the USEPA and the US Army Corps of Engineers.

Nonpoint Source

Pollution that is generated by various land use activities rather than from Pollution an identifiable or discrete source and is conveyed to waterways through natural processes, such as rainfall, stormwater runoff, or groundwater seepage rather than direct discharges.

One Hundred-Year

The area of land adjacent to a stream that is subject to inundation during a storm floodplain event that has a recurrence interval of 100 years.

Pollution

Any contamination or alteration of the physical, chemical, or biological properties of any waters that will render the waters harmful or detrimental to

1. Public health, safety, or welfare
2. Domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses
3. Livestock, wild animals, or birds
4. Fish or other aquatic life

Stream Channel

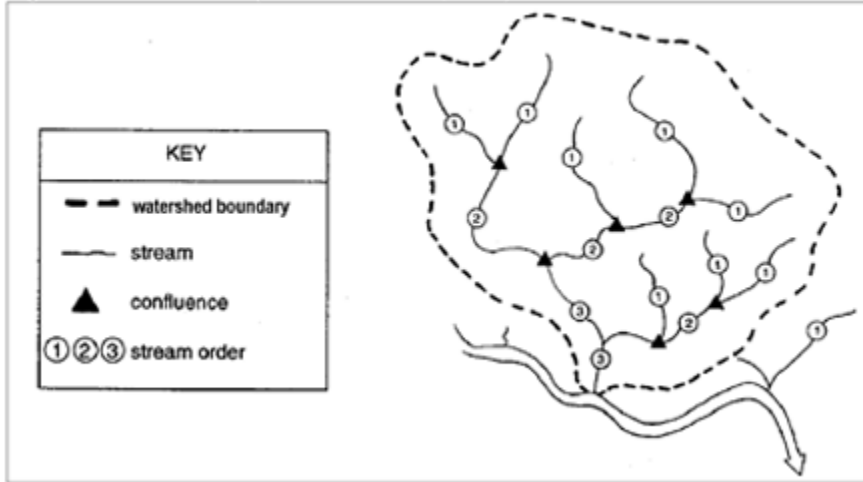
Part of a watercourse either naturally or artificially created that contains an intermittent or perennial base flow of groundwater origin. Base flows of groundwater origin can be distinguished by any of the following physical indicators:

1. Hydrophytic vegetation, hydric soil, or other hydrologic indicators in the area(s) where groundwater enters the stream channel in the vicinity of the stream headwaters, channel bed, or channel banks
2. Flowing water not directly related to a storm event
3. Historical records of a local high groundwater table, such as well and stream gauge records.

Stream Order

A classification system for streams based on stream hierarchy. The smaller the stream, the lower its numerical classification. For example, a first-order stream does not have tributaries and normally originates from springs and/or seeps. (See Figure 1.)

Figure 1: Stream Order (Source: Schueler, 1995)



Stream System

A stream channel together with one or both of the following:

1. 100-year floodplain
2. Hydrologically related nontidal wetland

Streams

Perennial and intermittent watercourses identified through site inspection and US Geological Survey (USGS) maps. Perennial streams are those which are depicted on a USGS map with a solid blue line. Intermittent streams are those which are depicted on a USGS map with a dotted blue line.



Defining the term "stream" is perhaps the most contentious issue in the definition of stream buffers. This term determines the origin and the length of the stream buffer. Although some jurisdictions restrict the buffer to perennial or "blue line" streams, others include both perennial and intermittent streams in the stream buffer program. Some communities do not rely on USGS maps and instead prepare local maps of all stream systems that require a buffer.

Water Pollution


A land use or activity that causes a relatively high risk of potential water pollution. Hazard


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Section IV. Applications

- A. This ordinance shall apply to all proposed development except for that development which meets waiver or variance criteria as outlined in Section IX of this regulation.
- B. This ordinance shall apply to all timber harvesting activities, except those timber harvesting operations which are implementing a forest management plan that has been deemed to be in compliance with the regulations of the buffer ordinance and has received approval from _____ (state forestry agency).

- C. This ordinance shall apply to surface mining operations except that the design standards shall not apply to active surface mining operations that are operating in compliance with an approved _____ (state or federal agency) surface mining permit.
- D. The ordinance shall not apply to agricultural operations that are covered by an approved Natural Resources Conservation Service (NRCS) conservation plan that includes the application of BMPs.

 *Communities should carefully consider whether exempt agricultural operations from the buffer ordinance because buffer regulations may take land out of production and impose a financial burden on family farms. Many communities exempt agricultural operations if they have an approved NRCS conservation plan. In some regions, agricultural buffers may be funded through the Conservation Reserve Program (CRP). For further information, consult the Conservation Technology Information Center (CTIC) at www.ctic.purdue.edu.*


 Livestock operations near and around streams may be regulated by communities. Livestock can significantly degrade the stream system and accelerate streambank erosion. King County Livestock Management Ordinance is one example of a local livestock ordinance. For more information, contact the King County Department of Development and Environmental Services at (206) 296-6602.

- F. Except as provided in Section IX, this ordinance shall apply to all parcels of land, structures, and activities that are causing or contributing to
 - 1. Pollution, including nonpoint source pollution, of the waters of the jurisdiction adopting this ordinance
 - 2. Erosion or sedimentation of stream channels
 - 3. Degradation of aquatic or riparian habitat


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Section V Plan Requirements


- A. In accordance with Section IV of this ordinance, a plan approved by the appropriate agency is required for all development, forest harvesting operations, surface mining operations, and agricultural operations.
- B. The plan shall set forth an informative, conceptual, and schematic representation of the proposed activity by means of maps, graphs, charts, or other written or drawn documents so as to enable the agency an opportunity to make a reasonably informed decision regarding the proposed activity..
- C. The plan shall contain the following information:

 The ordinance can identify the scale of maps to be included with the analyses in items 2) through 7). A 1"=50' to 1"=100' scale will generally provide sufficient detail.

- 1. A location or vicinity map
- 2. Field delineated and surveyed streams, springs, seeps, bodies of water, and wetlands (include a minimum of 200 feet into adjacent properties)
- 3. Field delineated and surveyed forest buffers
- 4. Limits of the ultimate 100-year floodplain

 *The limits of the ultimate floodplain (i.e., the floodplain under "built-out" conditions) may not be available in all locations.*

5. Hydric soils mapped in accordance with the NRCS soil survey of the site area
6. Steep slopes greater than 15 percent for areas adjacent to and within 200) feet of streams, wetlands, or other waterbodies.


 *The ordinance may also explicitly define how slopes are measured. For example, the buffer may be divided into sections of a specific width (e.g., 25 feet) and the slope for each segment reported. Alternatively, slopes can be reported in segments divided by breaks in slope.*

7. A narrative of the species and distribution of existing vegetation within the buffer
- D. The buffer plan shall be submitted in conjunction with the required grading plan for any development, and the forest buffer should be clearly delineated on the final grading plan.
 - E. Permanent boundary markers, in the form of signage approved by _____ (*natural resources or planning agency*), shall be installed prior to final approval of the required clearing and grading plan. Signs shall be placed at the edge of the middle zone (See Section VI.I).


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Section VI Design Standards for Forest Buffers

- A. A forest buffer for a stream system shall consist of a forested strip of land extending along both sides of a stream and its adjacent wetlands, floodplains, or slopes. The forest buffer width shall be adjusted to include contiguous sensitive areas, such as steep slopes or erodible soils, where development or disturbance may adversely affect water quality, streams, wetlands, or other waterbodies.
- B. The forest buffer shall begin at the edge of the stream bank of the active channel.
- C. The required width for all forest buffers (i.e., the base width) shall be a minimum of 100 feet, with the requirement to expand the buffer depending on
 1. Stream order
 2. Percent slope
 3. 100-year floodplain
 4. Wetlands or critical areas.

 *The width of the stream buffer varies from 20 feet to 200 feet in ordinances throughout the United States (Heraty, 1993). The width chosen by a jurisdiction will depend on the sensitivity and characteristics of the resource being protected and political realities in the community.*

5. In third order and higher streams, 25 feet shall be added to the base width of the forest buffer.
6. The forest buffer width shall be modified if steep slopes are within close proximity to the stream and drain into the stream system. In those cases, the forest buffer width may be adjusted.

 Several methods may be used to adjust buffer width for steep slopes. Two examples follow:

Method A	
Percent Slope	Width of Buffer
15%-17%	add 10 feet
18%-20%	add 30 feet
21%-23%	add 50 feet
24%-25%	add 60 feet

8.

Method B		
Percent Slope	Type of Stream Use	
	Water Contact Recreational Use	Sensitive Stream Habitat
0 to 14%	no charge	add 50 feet
15 to 25%	add 25 feet	add 75 feet
Greater than 25%	add 50 feet	add 100 feet

9.


10. Forest buffers shall be extended to encompass the entire 100-year floodplain and a zone with a minimum width of 25 feet beyond the edge of the floodplain.


11. When wetland or critical areas extend beyond the edge of the required buffer width, the buffer shall be adjusted so that the buffer consists of the extent of the wetland plus a 25-foot zone extending beyond the wetland edge.

D. Water Pollution Hazards

The following land uses and/or activities are designated as potential water pollution hazards, and must be set back from any stream or waterbody by the distance indicated below:

1. Storage of hazardous substances - (150 feet)
2. Above ground or underground petroleum storage facilities - (150 feet)
3. Drainfields from onsite sewage disposal and treatment systems (i.e., septic systems) - (100 feet)
4. Raised septic systems - (250 feet)
5. Solid waste landfills or junkyards - (300 feet)
6. Confined animal feedlot operations - (250 feet)
7. Subsurface discharges from a wastewater treatment plant - (100 feet)
8. Land application of biosolids - (100 feet)

 For surface water supplies, the setbacks should be doubled.

 A community should carefully consider which activities or land uses should be designated as potential water pollution hazards. The list of potential hazards shown above is not exhaustive, and others may need to be added depending on the major pollutants of concern and the uses of water.

- F. The forest buffer shall be composed of three distinct zones, with each zone having its own set of allowable uses and vegetative targets as specified in this ordinance. (See Figure 2).

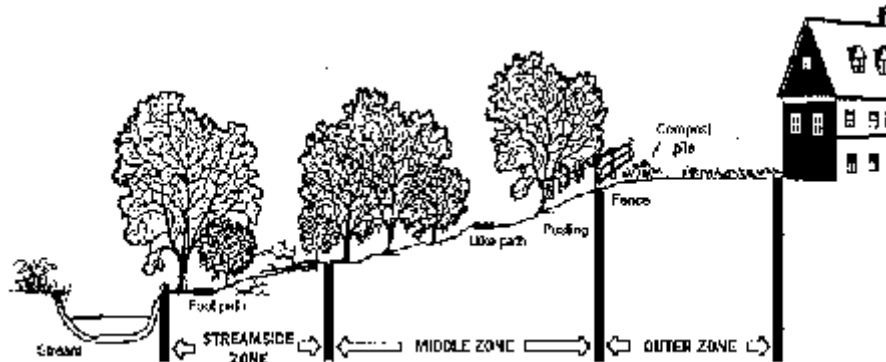


Figure 2: Three Zone Buffer System (Adapted from Welsch, 1991)

Although a three-zone buffer system is highly recommended, the widths and specific uses allowed in each zone may vary between jurisdictions.

1. Zone 1, Streamside Zone
 1. Protects the physical and ecological integrity of the stream ecosystem.
 2. Begins at the edge of the stream bank of the active channel and extend a minimum of 25 feet from the top of the bank.
 3. Allowable uses within this zone are highly restricted to:
 1. Flood control structures
 2. Utility right of ways
 3. Footpaths
 4. Road crossings, where permitted.
 4. Target for the streamside zone is undisturbed nature vegetation.

This ordinance assumes that the native vegetation in the stream corridor is forest. In some regions of the United States, other vegetation such as prairie may be native. See [the Napa, California](#), buffer ordinance for an example of a stream buffer ordinance that protects nonforested systems.


2. Zone 2, Middle Zone
 1. Protects key components of the stream and provides distance between upland development and the streamside zone.
 2. Begins at the outer edge of the streamside zone and extends a minimum of 50 feet plus any additional buffer width as specified in Section this section.
 3. Allowable uses within the middle zone are restricted to
 1. Biking or hiking paths
 2. Stormwater management facilities, with the approval of _____ (local agency responsible for stormwater).
 3. Recreational uses as approved by _____ (planning agency).
 4. Limited tree clearing with approval from _____ (forestry agency).
 4. Targets mature native vegetation adapted to the region.
3. Zone 3, Outer Zone


1. Prevents encroachment into the forest buffer and to filter runoff from residential and commercial development.
2. Begins at the outward edge of the middle zone and provides a minimum width of 25 feet between Zone 2 and the nearest permanent structure.
3. Restricts septic systems, permanent structures or impervious cover, with the exception of paths.
4. Encourages the planting of native vegetation to increase the total width of the buffer.

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Section VII Buffer Management and Maintenance

- A. The forest buffer, including wetlands and floodplains, shall be managed to enhance and maximize the unique value of these resources. Management includes specific limitations on alteration of the natural conditions of these resources. The following practices and activities are restricted within Zones 1 and 2 of the forest buffer, except with approval by _____ (forestry, planning or natural resources agency):
 1. Clearing of existing vegetation
 2. Soil disturbance by grading, stripping, or other practices
 3. Filling or dumping
 4. Drainage by ditching, underdrains, or other systems
 5. Use, storage, or application of pesticides, except for spot spraying of noxious weeds or non-native species consistent with recommendations of _____ (forestry agency)
 6. Housing, grazing, or other maintenance of livestock
 7. Storage or operation of motorized vehicles, except for maintenance and emergency use approved by _____ (forestry, planning, or natural resources agency)
- B. The following structures, practices, and activities are permitted in the forest buffer, with specific design or maintenance features, subject to the review of _____ (forestry, planning, or natural resources agency):
 1. Roads, bridges, paths, and utilities:
 1. An analysis needs to be conducted to ensure that no economically feasible alternative is available.
 2. The right-of-way should be the minimum width needed to allow for maintenance access and installation.
 3. The angle of the crossing shall be perpendicular to the stream or buffer in order to minimize clearing requirements.
 4. The minimum number of road crossings should be used within each subdivision, and no more than one fairway crossing is allowed for every 1,000 feet of buffer.
 2. Stormwater management:
 1. An analysis needs to be conducted to ensure that no economically feasible alternative is available and that the project is either necessary for flood control, or significantly improves the water quality or habitat in the stream.
 2. In new developments, onsite and nonstructural alternatives will be preferred over larger facilities within the stream buffer.
 3. When constructing stormwater management facilities (i.e., BMPs), the area cleared will be limited to the area required for construction and adequate maintenance access, as outlined in the most recent edition of _____ (refer to stormwater manual).


 Rather than placing specific stormwater BMP design criteria in an ordinance, it is often preferable to reference a manual. With this approach, specific design information can be changed over time without going through the formal process needed to change ordinance language.

 The Maryland Stormwater Design Manual, is one example of an up-to-date stormwater design manual. For more information, go to www.mde.state.md.us. Under topics, choose "Stormwater Design Manual".


5. Material dredged or otherwise removed from a BMP shall be stored outside the buffer.
 3. Stream restoration projects, facilities and activities approved by _____ (forestry, planning or natural resources agency) are permitted within the forest buffer.
 4. Water quality monitoring and stream gauging are permitted within the forest buffer, as approved by _____ (forestry, planning or natural resources agency).
 5. Individual trees within the forest buffer that are in danger of falling, causing damage to dwellings or other structures, or causing blockage of the stream may be removed.
 6. Other timber cutting techniques approved by the agency may be undertaken within the forest buffer under the advice and guidance of _____ (state or federal forestry agency) if necessary to preserve the forest from extensive pest infestation, disease infestation, or threat from fire.
- C. All plans prepared for recording and all right-of-way plans shall clearly:
1. Show the extent of any forest buffer on the subject property
 2. Label the forest buffer
 3. Provide a note to reference any forest buffer stating: "There shall be no clearing, grading, construction or disturbance of vegetation except as permitted by the agency".
 4. Provide a note to reference any protective covenants governing all forest buffers areas stating: "Any forest buffer shown hereon is subject to protective covenants that may be found in the land records and that restrict disturbance and use of these areas."
- D. All forest buffer areas shall be maintained through a declaration of protective covenant, which is required to be submitted for approval by _____ (planning board or agency). The covenant shall be recorded in the land records and shall run with the land and continue in perpetuity.

 This protective covenant can be kept either by the local government agency responsible for management of environmental resources or by an approved nonprofit organization. An example [land trust agreement](#) is included later in this section.

- E. All lease agreements must contain a notation regarding the presence and location of protective covenants for forest buffer areas and shall contain information on the management and maintenance requirements for the forest buffer for the new property owner.
- F. An offer of dedication of a forest buffer area to the agency shall not be interpreted to mean that this automatically conveys to the general public the right of access to this area.
- G. _____ (responsible individual or group) shall inspect the buffer annually and immediately following severe storms for evidence of sediment deposition, erosion, or concentrated flow channels and corrective actions taken to ensure the integrity and functions of the forest buffer.

 *A local ordinance will need to designate the individual or group responsible for buffer maintenance. Often, the responsible party will be identified in protective covenants associated with the property.*

- H. Forest buffer areas may be allowed to grow into their vegetative target state naturally, but methods to enhance the successional process such as active reforestation may be used when deemed necessary by _____ (*natural resources or forestry agency*) to ensure the preservation and propagation of the buffer area. Forest buffer areas may also be enhanced through reforestation or other growth techniques as a form of mitigation for achieving buffer preservation requirements.

 *Explicit forestry management criteria are often included in a forestry or natural resources conservation ordinance. An example forest conservation ordinance from Frederick County, Maryland is included in the [miscellaneous ordinances](#) section of this site.*

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Section VIII Enforcement Procedures

- A. _____ (*director of responsible agency*) or his/her designee is authorized and empowered to enforce the requirements of this ordinance in accordance with the procedures of this section.
- B. If, upon inspection or investigation, the director or his/her designee is of the opinion that any person has violated any provision of this ordinance, he/she shall with reasonable promptness issue a correction notice to the person. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance that has been violated. In addition, the notice shall set a reasonable time for the abatement and correction of the violation.
- C. If it is determined that the violation or violations continue after the time fixed for abatement and correction has expired, the director shall issue a citation by certified mail to the person who is in violation. Each such notice shall be in writing and shall describe the nature of the violation, including a reference to the provision within this ordinance that has been violated and what penalty, if any, is proposed to be assessed. The person charged has 30 days within which to contest the citation or proposed assessment of penalty and to file a request for a hearing with the director or his/her designee. At the conclusion of this hearing, the director or his/her designee will issue a final order, subject to appeal to the appropriate authority. If, within 30 days from the receipt of the citation issued by the director, the person fails to contest the citation or proposed assessment of penalty, the citation or proposed assessment of penalty shall be deemed the final order of the director.
- D. Any person who violates any provision of this ordinance may be liable for any cost or expenses incurred as a result thereof by the agency.
- E. Penalties that may be assessed for those deemed to be in violation may include the following:
1. A civil penalty not to exceed \$1,000.00 for each violation. Every day that such violation(s) continue will be considered a separate offense.
 2. A criminal penalty in the form of a fine of not more than \$1,000.00 for each violation, or imprisonment for not more than 90 days, or both. Every day that such violation(s) continue will be considered a separate offense.
 3. Anyone who knowingly makes any false statements in any application, record, or plan required by this ordinance shall upon conviction be punished by a fine of not more than \$1,000.00 for each violation, imprisonment for not more than 30 days, or both.



Specific penalties will vary between communities, and should reflect realistically enforceable penalties given the political realities of a jurisdiction.

- F. In addition to any other sanctions listed in this ordinance, a person who fails to comply with the provisions of this buffer ordinance shall be liable to the agency in a civil action for damages in an amount equal to twice the cost of restoring the buffer. Damages that are recovered in accordance with this action shall be used for the restoration of buffer systems or for the administration of programs for the protection and restoration of water quality, streams, wetlands, and floodplains.

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Section IX Waivers/Variations

- A. This ordinance shall apply to all proposed development except for activities that were completed prior to the effective date of this ordinance and had received the following:
 - 1. A valid, unexpired permit in accordance with development regulations
 - 2. A current, executed public works agreement
 - 3. A valid, unexpired building permit
 - 4. A waiver in accordance with current development regulations.
- B. The director of the agency may grant a variance for the following:
 - 1. Those projects or activities for which it can be demonstrated that strict compliance with the ordinance would result in a practical difficulty or financial hardship
 - 2. Those projects or activities serving a public need where no feasible alternative is available
 - 3. The repair and maintenance of public improvements where avoidance and minimization of adverse impacts to nontidal wetlands and associated aquatic ecosystems have been addressed
 - 4. Those developments which have had buffers applied in conformance with previously issued requirements
- C. Waivers for development may also be granted in two additional forms, if deemed appropriate by the director:
 - 1. The buffer width made be reduced at some points as long as the average width of the buffer meets the minimum requirement. This averaging of the buffer may be used to allow for the presence of an existing structure or to recover a lost lot, as long as the streamside zone (Zone I) is not disturbed by the reduction and no new structures are built within the 100-year floodplain.
 - 2. _____ (*planning agency*) may offer credit for additional density elsewhere on the site in compensation for the loss of developable land due to the requirements of this ordinance. This compensation may increase the total number of dwelling units on the site up to the amount permitted under the base zoning.
- D. The applicant shall submit a written request for a variance to the director of the agency. The application shall include specific reasons justifying the variance and any other information necessary to evaluate the proposed variance request. The agency may require an alternative analysis that clearly demonstrates that no other feasible alternatives exist and that minimal impact will occur as a result of the project or development.
- E. In granting a request for a variance, the director of the agency may require site design, landscape planting, fencing, signs, and water quality best management practices to reduce adverse impacts on water quality, streams, wetlands, and floodplains.

Section X Conflict With Other Regulations

Where the standards and management requirements of this buffer ordinance are in conflict with other laws, regulations, and policies regarding streams, steep slopes, erodible soils, wetlands, floodplains, timber harvesting, land disturbance activities, or other environmental protective measures, the more restrictive shall apply.

References

- Heraty, M. 1993. Riparian buffer programs: a guide to developing and implementing a riparian buffer program as an urban best management practice. Metropolitan Washington Council of Governments, USEPA Office of Wetlands, Oceans and Watersheds. Washington, DC.
- Schueler, T. 1995. Site planning for urban stream protection. Metropolitan Washington Council of Governments, USEPA Office of Wetlands, Oceans and Watersheds. Washington, DC.
- Welsch, D. 1991. Riparian forest buffers. FS Pub. No. NA-PR-07-91. US Department of Agriculture, Forest Service. Forest Resources Management, Radnor, PA.

Erosion & Sedimentation Model Ordinance

Section I. Introduction/ Purpose

During the construction process, soil is highly vulnerable to erosion by wind and water. Eroded soil endangers water resources by reducing water quality and causing the siltation of aquatic habitat for fish and other desirable species. Eroded soil also necessitates repair of sewers and ditches and the dredging of lakes. In addition, clearing and grading during construction cause the loss of native vegetation necessary for terrestrial and aquatic habitat.

As a result, the purpose of this local regulation is to safeguard persons, protect property, and prevent damage to the environment in _____ (*municipality*). This ordinance will also promote the public welfare by guiding, regulating, and controlling the design, construction, use, and maintenance of any development or other activity that disturbs or breaks the topsoil or results in the movement of earth on land in _____ (*municipality*).

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Section II. Definitions

Certified Contractor

A person who has received training and is licensed by _____ (*state or local environmental agency*) to inspect and maintain erosion and sediment control practices.

Clearing

Any activity that removes the vegetative surface cover.

Drainage Way

Any channel that conveys surface runoff throughout the site.

Erosion Control

A measure that prevents erosion.

Erosion and Sediment

A set of plans prepared by or under the direction of a licensed professional engineer

Control Plan

indicating the specific measures and sequencing to be used to control sediment and erosion on a development site during and after construction.

Grading

Excavation or fill of material, including the resulting conditions thereof.

Perimeter Control

A barrier that prevents sediment from leaving a site by filtering sediment-laden runoff or diverting it to a sediment trap or basin.

Phasing

Clearing a parcel of land in distinct phases, with the stabilization of each phase completed before the clearing of the next.

Sediment Control

Measures that prevent eroded sediment from leaving the site.

Site

A parcel of land or a contiguous combination thereof, where grading work is performed as a single unified operation.

Site Development

A permit issued by the municipality for the construction or alteration of ground

Permit

improvements and structures for the control of erosion, runoff, and grading.

Stabilization

The use of practices that prevent exposed soil from eroding.

Start of Construction

The first land-disturbing activity associated with a development, including land preparation such as clearing, grading, and filling; installation of streets and walkways; excavation for basements, footings, piers, or foundations; erection of temporary forms; and installation of accessory buildings such as garages.

Watercourse Any body of water, including, but not limited to lakes, ponds, rivers, streams, and bodies of water delineated by _____ (*municipality*).


Waterway

A channel that directs surface runoff to a watercourse or to the public storm drain.


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Section III. Permits


- A. No person shall be granted a site development permit for land-disturbing activity that would require the uncovering of *10,000 or more square feet* without the approval of an Erosion and Sediment Control Plan by _____ (*erosion and sediment control agency*).

 *The size of the site regulated under the erosion and sediment control ordinance varies widely. The proposed Phase II of USEPA's National Pollutant Discharge Elimination System (NPDES) rules regulates disturbances greater than 1 acre, but communities may regulate sites as small as 2,000 square feet.*

- B. No site development permit is required for the following activities:
1. Any emergency activity that is immediately necessary for the protection of life, property, or natural resources.
 2. Existing nursery and agricultural operations conducted as a permitted main or accessory use.

 *Communities may choose to exempt other activities, such as mining, from an erosion and sediment control permit, or in some cases include the exempted uses cited above.*

- C. Each application shall bear the name(s) and address(es) of the owner or developer of the site, and of any consulting firm retained by the applicant together with the name of the applicant's principal contact at such firm and shall be accompanied by a filing fee.
- D. Each application shall include a statement that any land clearing, construction, or development involving the movement of earth shall be in accordance with the Erosion and Sediment Control Plan and that a certified contractor shall be on site on all days when construction or grading activity takes place.

 *Some states have "Certified Contractor" programs, in which contractors successfully complete a training course in basic erosion and sediment control. This person would be responsible for*

ensuring the regular maintenance and proper installation of erosion and sediment control measures.

- E. The applicant will be required to file with _____ (*municipality*) a faithful performance bond, letter of credit, or other improvement security in an amount deemed sufficient by _____ (*erosion and sediment control agency*) to cover all costs of improvements, landscaping, maintenance of improvements for such period as specified by _____ (*municipality*), and engineering and inspection costs to cover the cost of failure or repair of improvements installed on the site.

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Section IV. Review and approval

1. _____ (*erosion and sediment control agency*) will review each application for a site development permit to determine its conformance with the provisions of this regulation. Within 30 days after receiving an application, _____ (*erosion and sediment control agency*) shall, in writing:
 1. Approve the permit application;
 2. Approve the permit application subject to such reasonable conditions as may be necessary to secure substantially the objectives of this regulation, and issue the permit subject to these conditions; or
 3. Disapprove the permit application, indicating the reason(s) and procedure for submitting a revised application and/or submission.
2. Failure of the _____ (*erosion and sediment control agency*) to act on an original or revised application within 30 days of receipt shall authorize the applicant to proceed in accordance with the plans as filed unless such time is extended by agreement between the applicant and _____ (*erosion and sediment control agency*). Pending preparation and approval of a revised plan, development activities shall be allowed to proceed in accordance with conditions established by _____ (*erosion and sediment control agency*).

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Section V. Erosion and Sediment Control Plan

- A. The Erosion and Sediment Control Plan shall include the following:
1. A natural resources map identifying soils, forest cover, and resources protected under other chapters of this code.



This map should be at a scale no smaller than 1"=100'. For a more detailed discussion, see the buffer ordinance.

2. A sequence of construction of the development site, including stripping and clearing; rough grading; construction of utilities, infrastructure, and buildings; and final grading and landscaping. Sequencing shall identify the expected date on which clearing will begin, the estimated duration of exposure of cleared areas, areas of clearing, installation

of temporary erosion and sediment control measures, and establishment of permanent vegetation.

3. All erosion and sediment control measures necessary to meet the objectives of this local regulation throughout all phases of construction and after completion of development of the site. Depending upon the complexity of the project, the drafting of intermediate plans may be required at the close of each season.
 4. Seeding mixtures and rates, types of sod, method of seedbed preparation, expected seeding dates, type and rate of lime and fertilizer application, and kind and quantity of mulching for both temporary and permanent vegetative control measures.
 5. Provisions for maintenance of control facilities, including easements and estimates of the cost of maintenance.
- B. Modifications to the plan shall be processed and approved or disapproved in the same manner as Section IV of this regulation, may be authorized by _____ (*erosion and sediment control agency*) by written authorization to the permittee, and shall include
1. Major amendments of the erosion and sediment control plan submitted to _____ (*erosion and sediment control agency*)
 2. Field modifications of a minor nature

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Section VI. Design Requirements

1. Grading, erosion control practices, sediment control practices, and waterway crossings shall meet the design criteria set forth in the most recent version of _____ (*erosion and sediment control manual*), and shall be adequate to prevent transportation of sediment from the site to the satisfaction of (*erosion and sediment control agency*). Cut and fill slopes shall be *no greater than 2:1*, except as approved by _____ (*erosion and sediment control agency*) to meet other community or environmental objectives.
2. Clearing and grading of natural resources, such as forests and wetlands, shall not be permitted, except when in compliance with all other chapters of this Code. Clearing techniques that retain natural vegetation and drainage patterns, as described in _____ (*erosion and sediment control manual*), shall be used to the satisfaction of _____ (*erosion and sediment control agency*).
3. Clearing, except that necessary to establish sediment control devices, shall not begin until all sediment control devices have been installed and have been stabilized.



For example, the stream buffer codes as well as the forest conservation code in the "[Miscellaneous Ordinances](#)" section would also restrict clearing.


4. Phasing shall be required on all sites disturbing greater than 30 acres, with the size of each phase to be established at plan review and as approved by (*erosion and sediment control agency*).




Although many communities encourage phasing, few actually require it. Phasing construction can reduce erosion significantly when well designed. (See Claytor, 1997.)

5. Erosion control requirements shall include the following:

1. Soil stabilization shall be completed within *five days* of clearing or inactivity in construction.
2. If seeding or another vegetative erosion control method is used, it shall become established within *two weeks* or _____ (*erosion and sediment control agency*) may require the site to be reseeded or a nonvegetative option employed.

 Numerical standards regarding the time to stabilization will vary. In particular, the time to establish seeding will depend on the climate.

3. Special techniques that meet the design criteria outlined in (*erosion and sediment control manual*) on steep slopes or in drainage ways shall be used to ensure stabilization.
4. Soil stockpiles must be stabilized or covered at the end of each workday.
5. The entire site must be stabilized, using a heavy mulch layer or another method that does not require germination to control erosion, at the close of the construction season.
6. Techniques shall be employed to prevent the blowing of dust or sediment from the site.


 Dust control is most important in arid regions of the country

7. Techniques that divert upland runoff past disturbed slopes shall be employed.
6. Sediment controls requirements shall include
 1. Settling basins, sediment traps, or tanks and perimeter controls.
 2. Settling basins that are designed in a manner that allows adaptation to provide long term stormwater management, if required by _____ (*erosion and sediment control agency*)
 3. Protection for adjacent properties by the use of a vegetated buffer strip in combination with perimeter controls
7. Waterway and watercourse protection requirements shall include
 1. A temporary stream crossing installed and approved by _____ (*approving agency, e.g., Waterways Division, ESC agency*) if a wet watercourse will be crossed regularly during construction
 2. Stabilization of the watercourse channel before, during, and after any in-channel work
 3. All on-site stormwater conveyance channels designed according to the criteria outlined in _____ (*erosion and sediment control manual*)
 4. Stabilization adequate to prevent erosion located at the outlets of all pipes and paved channels
8. Construction site access requirements shall include
 1. a temporary access road provided at all sites
 2. other measures required by _____ (*erosion and sediment control agency*) in order to ensure that sediment is not tracked onto public streets by construction vehicles or washed into storm drains

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Section VII. Inspection

1. _____ (*erosion and sediment control agency*) or designated agent shall make inspections as hereinafter required and either shall approve that portion of the work completed or shall notify the permittee wherein the work fails to comply with the Erosion and Sediment Control Plan as approved. Plans for grading, stripping, excavating, and filling work bearing the stamp of approval of the _____ (*erosion and sediment control agency*) shall be maintained at the site during the progress of the work. To obtain inspections, the permittee shall notify _____ (*erosion and sediment control agency*) at least two working days before the following:
 1. Start of construction
 2. Installation of sediment and erosion measures
 3. Completion of site clearing
 4. Completion of rough grading
 5. Completion of final grading
 6. Close of the construction season
 7. Completion of final landscaping

 The "Certified Inspector Program" in Delaware allows developers to hire an inspector who has passed a state licensing program. This person would inspect the site at regular intervals and file reports to the erosion and sediment control agency. The agency would then be responsible for spot checks on these reports.

2. The permittee or his/her agent shall make regular inspections of all control measures in accordance with the inspection schedule outlined on the approved Erosion and Sediment Control Plan(s). The purpose of such inspections will be to determine the overall effectiveness of the control plan and the need for additional control measures. All inspections shall be documented in written form and submitted to _____ (*erosion and sediment control agency*) at the time interval specified in the approved permit.
3. _____ (*erosion and sediment control agency*) or its designated agent shall enter the property of the applicant as deemed necessary to make regular inspections to ensure the validity of the reports filed under Section B.

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Section VIII. Enforcement

1. **Stop-Work Order; Revocation of Permit**

In the event that any person holding a site development permit pursuant to this ordinance violates the terms of the permit or implements site development in such a manner as to materially adversely affect the health, welfare, or safety of persons residing or working in the neighborhood or development site so as to be materially detrimental to the public welfare or injurious to property or improvements in the neighborhood, _____ (*erosion and sediment control agency*) may suspend or revoke the site development permit.
2. **Violation and Penalties**

No person shall construct, enlarge, alter, repair, or maintain any grading, excavation, or fill, or cause the same to be done, contrary to or in violation of any terms of this ordinance. Any person violating any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and each day during which any violation of any of the provisions of this ordinance is committed, continued, or permitted, shall constitute a separate offense. Upon conviction of any such

violation, such person, partnership, or corporation shall be punished by a fine of not more than \$ _____ for each offense. In addition to any other penalty authorized by this section, any person, partnership, or corporation convicted of violating any of the provisions of this ordinance shall be required to bear the expense of such restoration.



Specific penalties will vary between communities and should reflect enforceable penalties given the political realities of a jurisdiction.

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Section IX. Separability

The provisions and sections of this ordinance shall be deemed to be separable, and the invalidity of any portion of this ordinance shall not affect the validity of the remainder.

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References


Claytor, R. 1997. Practical Tips for Construction Site Phasing. *Watershed Protection Techniques* 2(3): 413-417.

Open Space Development Model Ordinance


Section I. Background

Open space development has numerous environmental and community benefits, including the following:

1. Reduces the impervious cover in a development. Impervious cover contributes to degradation of water resources by increasing the volume of surface runoff, and preventing infiltration into the soil surface.
2. Reduces rainfall pollutant loads to streams and other water resources.
3. Reduces potential pressure to encroach on resource buffer areas.

 *The [aquatic buffers](#) section has more information on resource buffer areas and ways to protect them.*

4. Reduces soil erosion potential by reducing the amount of clearing and grading on the site.

 *The [Erosion and Sediment Control](#) section highlights other techniques to control erosion at construction sites.*

5. Preserves green space.
6. Preserves open space for recreation.
7. Reduces the capital cost of development.
8. Reduces the cost of stormwater management by concentrating runoff in one area and reducing runoff volumes.
9. Provides a wider range of feasible sites to locate stormwater best management practices (BMPs).
10. Reduces the cost of future public services needed by the development.
11. Can increase future property values.
12. Creates urban wildlife habitat "islands."
13. Creates a sense of community and pedestrian movement.
14. Can support other community planning goals, such as farmland preservation, affordable housing, and architectural diversity.

It is the desire of _____ (*planning agency*) to protect the natural, historic and community resources in _____ (*municipality*), by promoting open space development within our jurisdiction.

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Section II. Definitions

Base Density

The original density permitted under the property's residential zoning category (dwelling units per acre).

Community Open

The area of open space remaining after natural open space has been Space designated. The area may be used for passive or active recreation for stormwater management.

Frontage Distance

The width of a housing lot (in feet) that fronts along the street.

Green Space

Open space maintained in a natural, undisturbed, or revegetated condition.

Impervious Cover

Any surface in the urban/suburban landscape that cannot effectively absorb or infiltrate rainfall.

Natural Condition

The topography and vegetation of an area that is unaltered by clearing and grading during construction and protected in perpetuity.

Nontidal Wetlands

Those areas not influenced by tidal fluctuations 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 vegetation typically adapted for life in saturated soil conditions.



The definition of "nontidal wetland" here is adapted from the definition of "wetland" used by the USEPA and the Army Corps of Engineers. See the [Croton-on-Hudson Wetlands and Watercourses ordinance](#) for an example.

One Hundred-Year

The area of land adjacent to a stream that is subject to inundation during a storm Floodplain event that has a recurrence interval of 100 years.

Open Space

A portion of a development site that is permanently set aside for public or private use and will not be developed. Open space may be used as community open space or preserved as green space.

Open Space Development

A development pattern that arranges the layout of buildings in a compact area of the site so as to reserve a portion of the site for community open space or green space and is protected in perpetuity.

Right-of-Way

The width of a public roadway that encompasses the pavement width and adjacent land needed for placement of sidewalks, utilities, and stormwater drainage.

Setback

The distance a structure must be located from property lines or other structures.

Stream Buffer

A vegetated area bordering a stream that exists or is established to protect a stream system. Alteration of this vegetated area is strictly limited.

Unbuildable Land

The area of a site that includes wetlands and submerged areas, slopes of 25 percent or more, and the 100-year floodplain.




The definition of unbuildable land may not include all of these areas. For example, buffers might not be considered unbuildable in many jurisdictions. In addition, other areas might be considered unbuildable in some communities.


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Section III. Application

- A. The provisions of this ordinance apply to all residential zones with a density less than or equal to eight dwelling units per acre.
- B. The minimum size of an open space development shall be five acres.

- C. Open space is a by-right form of development, and shall not require a special exception or additional review.

 *Open space development can be: by special approval or by right. In most communities, open space development requires a special approval process. This requirement discourages the use of open space development because of the time required for approval compared with conventional development. When open space development is by right, an open space plan that meets the requirements of the ordinance goes through the same permit and approval process as a conventional development. The by-right form of development prohibits denial of an open space plan in favor of a conventional plan assuming the open space plan meets the provisions of the ordinance.*

 *In some cases, open space development is mandatory. The [Calvert County Open Space Ordinance](#) is one example where open space development is required in rural and large-lot zones.*

- E. Plans registered before the adoption of this ordinance are exempt from the provisions of this ordinance.

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
Section IV. Design Criteria

- A. The total number of residential units allowable within an open space development shall not exceed the number of units that would otherwise be allowed in the existing zoning district using conventional development. The total number of units allowed shall be determined using the following formula:

$$TU = BD*[A-(U+R)]$$


Where:


T = total units (dwelling units)
BD = base density (dwelling units/acre)
A = total site area (acres)
U = unbuildable land as defined in Section II (acres).
R = road and utility right-of-way (acres)

 *This method of determining the total dwelling units is known as a "partial-density transfer". In the alternative method, or "full-density transfer," the base density would be multiplied by the total area. Typically, the partial-density transfer option preserves a greater amount of open space. However, the full-density transfer might be preferable in many communities, particularly if regional density goals need to be met.*


- B. Frontage distance and rear, front, and side yard setbacks may be reduced to 50 percent of the requirements in the base zoning, subject to the following rules:
1. The frontage distance shall be no less than 10 feet.
 2. Front and rear yard setbacks shall be no less than 10 feet.

3. Sideyard setbacks shall be a minimum of five feet. This requirement may be waived if the regulations of the _____ (municipality) Fire Department are met.
- C. Lot size may be reduced to 25 percent of base density but no smaller than one-eighth of an acre.

 *As an alternative to narratively describing lot geometry requirements, a community may make a table of open space zoning requirements based on zoning category or may provide specific zoning text language that guides planning agency staff in approving appropriate subdivision projects.*

 *The values for lot geometry presented here are guidelines; jurisdiction need to select values that make sense within the context of existing regulations, and community goals.*

- E. Irregular lot shapes and shared driveways are permitted in open space design.
- F. Shared septic systems may be permitted provided that the requirements of the _____ (municipality) Health Department are met, including appropriate provisions for legal obligations related to maintenance and replacement.

 *The use of shared septic systems is controversial, primarily because of the maintenance responsibility. In many communities, shared systems become the responsibility of the local jurisdiction. However, requiring one septic system per lot makes open space development more challenging.*


- G. The number of parking spaces required for a residential open space development shall be two spaces per dwelling unit. Parking may be provided either on the street or in driveways.

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Section V. Open Space Requirements


- A. The total area of dedicated open space shall equal the amount by which all dwelling unit lots are reduced below the base zoning and shall meet the requirements outlined in Table 1.

Table 1. Open Space Required for Various Densities	
Base Density (du/ac)	Open Space Required (% of buildable area)
>1	35%
0.5>BD<1	40%
0.2<0.5	45%
<0.2	50%


 *The amount of open space should increase with decreasing density because of the feasibility of protecting open space in these areas. In rural open space designs, the techniques used are typically different from those used in more suburban areas. For example, homes might be clustered in small groups or "pods" that retain a rural character.*

- C. The following activities or land uses may not be counted as a part of designated open space:
1. Land considered unbuildable under Section II


2. Existing rights-of-way and utility easements
3. Setbacks and lawns

 *In the full-density transfer option, a greater percentage of open space would be required (up to 75 percent of the total site area). However, unbuildable land would be included in the dedicated open space.*

- D. The following areas shall be high priorities for inclusion in designated open space:
 1. Resource buffers
 2. High-quality forest resources
 3. Individual trees
 4. Critical habitat areas
 5. High-quality soil resources
- E. At least 75 percent of designated open space shall be contiguous with no portion less than 100 feet wide.
- F. At least 50 percent of designated open space shall be designated as "green space" as defined in Section II and shall be maintained in a natural, undisturbed condition.

 *In the full-density transfer option, a greater fraction of the open space would be green space, but the open space would include unbuildable areas such as wetlands.*

- G. Reasonable effort must be made to locate green space adjacent to green space in an adjoining property(s) to the satisfaction of _____ (*planning agency*).
- H. Limited access to green space may be allowed in the form of a walking or hiker/biker path, the total area of which must be no more than 2 percent of the total green space area.
- I. The remaining designated open space may be "community space" and may be used for passive or active recreation or the location of stormwater management facilities.
 - A. If used for stormwater management, all design, construction, maintenance, and public safety requirements shall be met using the design criteria set forth in _____ (*stormwater manual*).
 - B. If used for recreation, impervious cover shall not exceed 5 percent of this area.


 *The Maryland Stormwater Design Manual is one example of an up-to-date stormwater design manual. For more information, go to www.mde.state.md.us. Under topics, choose "Stormwater Design Manual".*

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Section VI. Open Space Management

- A. The boundaries of designated open space areas, recreation areas, stormwater management facilities, and green space shall be clearly delineated on plans, including record plats, and marked in the field with signage approved by _____ (*planning agency*) to distinguish these areas from private property.
- B. Development in designated open spaces in the future is prohibited. Ownership of open space shall be designated through one of the following options:
 1. 1) Ownership by the individual lot owners as a homeowners' association. The deed to each lot shall include a proportionate share of the common open space. Each lot owner

shall be required to be a member of a homeowner's association, which shall be formed prior to conveyance of the first lot. The assessment of dues or fees for structural improvements requires the affirmative vote of no less than two-thirds of the homeowners' association membership.

 *A well-designed homeowner's association is an effective way to manage community open space.*

2. Conservation easement.
 - a. If owned by a separate entity, a [land trust agreement](#) shall be established for the area as defined in subsection 3 below and shall be given to _____ (*municipality*)
 - b. 2) A conservation easement, established as defined in subsection 3), may be transferred to an established, designated land trust organization, among whose purposes is to conserve open space and/or natural resources. This option is recommended for natural open space areas. Such transfer is allowable, provided that
 - i. The organization is acceptable to _____ (*planning agency*) and is a bona fide conservation organization with perpetual existence;
 - ii. The conveyance contains appropriate provision for proper reverter or retransfer in the event that organization becomes unwilling or unable to continue carrying out its functions; and
 - iii. A maintenance agreement acceptable to the homeowners' association is entered into by the developer and the organization.
 - c. The conservation easement shall
 - 1) Protect open space from future development and environmental damage by restricting the area from any future building and from the removal of soil, trees, and other natural features, except as is consistent with conservation, recreation, or agricultural uses or uses accessory to permitted uses.
 - a. Provide that residents have access to the open space at all times.
 - b. Dictate whether open space is for the benefit of residents only or may be open to residents of _____ (*municipality*).

 *A [model conservation easement](#) is included in the aquatic buffer section.*

3. 3) An open space management entity shall ensure that the open space will be protected in perpetuity from all forms of development, except as shown on an approved development plan and that it will never be changed to another use. The management entity shall
 - Prescribe all allowable and unallowable uses and activities within such open space.
 - a. Provide detailed standards and schedules for maintenance of the open space, including vegetative management.
 - b. If there is not sufficient compliance with the homeowner's maintenance agreement, allow for county or municipal maintenance of open space.